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ABSTRACT

This is the teacher's manual to accompany part 2 of the workbook for grade 3 pupils in the Comprehensive Instructional Management System, a teacher-designed unified mathematics curriculum for kindergarten through grade 7. It is composed of a curriculum, a testing component, and a computer-managed reporting system. The curriculum is organized into modules of similar skills or understandings from 14 topics. Each module has: a suggested period of duration for student mastery; a listing of new skills to be mastered by the student in the form of performance objectives; a section devoted to vocabulary, terms, and symbols; getting-started activities on prerequisite skills in preparation for undertaking new objectives; strategies for teaching the new skills; and student activities for providing reinforcement for the newly learned objective. After the sequence of modules and content by topic are displayed, teaching suggestions for 68 modules on over 120 performance objectives are given. The content is from the topics of: numbers and numeration; addition; subtraction; multiplication; division; fractions; decimals; geometry; measurement; algebraic concepts; graphs, probability, and statistics; and problem solving, plus review. Pages from the student's workbook are interspersed with the suggested activities. (MNS)

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CIMS

COMPREHENSIVE INSTRUCTIONAL MANAGEMENT SYSTEM

A Cyclical Mathematics Curriculum

PART 2—TEACHER

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See catalogue for price.

FOREWORD

The Comprehensive Instructional Management System (CIMS) is a unified mathematics curriculum for grades K-7. The curriculum is cyclical in design, and reflects the most recent New York City and New York State guidelines.

Utilizing the experience of our system's teachers, we have developed a teacher-designed curriculum that includes a rich selection of classroom-tested successful mathematics activities. The major goal of the CIMS mathematics project is to provide the classroom teacher with a well-structured, objective-based curriculum. All objectives are supported by a variety of strategies. Student mastery of these objectives is readily diagnosed through the system's testing component.

The curriculum format is structured to allow the teacher to determine the ability level of the students in the topic under study, and to permit the students to move forward at their individual rates. Each module of instruction provides the teacher with a set of related performance objectives. These objectives are supported by activities which probe and develop the students' readiness to undertake new skills and concepts. Further reinforcement is given to mastery of the objectives through accompanying student workbooks.

It is hoped that this curriculum will not only assist teachers in developing vital mathematics instruction, but will serve to expand and enrich students' mathematics skills.

Charlotte Frank

Charlotte Frank,
Executive Director
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ACKNOWLEDGMENTS

The Comprehensive Instructional Management System (CIMS) was developed as a project of the Division of Curriculum and Instruction, Charlotte Frank, Executive Director. Dr. Peter Negroni, Community School Superintendent CSD 12; Dr. Harvey Garner, Community School Superintendent CSD 18; Carlos Edwards, Community School Superintendent CSD 23, and Joseph Pacheco, Community School Superintendent CSD 32 supervised the overall development of the CIMS program within their respective districts.

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INTRODUCTION

The Comprehensive Instructional Management System (CIMS) is a teacher-designed educational delivery system composed of a curriculum, a testing component and a computer managed reporting system.

Designed to support mathematics instruction in the classroom, CIMS provides a comprehensive cyclical mathematics curriculum for grades K through 7. Each manual describes the curriculum for a single level or grade. Teacher curriculum developers from elementary, intermediate and senior high schools utilized the most current New York City and New York State guidelines in formulating the curriculum's modules and sequence.

Curriculum Topics

The CIMS mathematics curriculum has been organized into the following 14 topics:

.01	Numbers and Numeration
.02	Addition of Whole Numbers
.03	Subtraction of Whole Numbers
.04	Multiplication of Whole Numbers
.05	Division of Whole numbers
.06	Fractions
.07	Decimals
.08	Integers
.09	Geometry
.10	Measurement
.11	Algebraic Concepts
.12	Graphs, Probability, Statistics
.13	Problem Solving
.14	Review

Modules of Instruction

The CIMS curriculum is organized into modules or groupings of similar skills or understandings. Each module has a suggested period of duration for student mastery, a listing of new skills to be mastered by the student in the form of performance objectives, a section devoted to vocabulary, terms and symbols, getting started activities which serve as prerequisite skills in preparation for undertaking new objectives, strategies for teaching the new skills and student activities for providing reinforcement for the newly learned objective. Note that the lesson duration is included only as a guideline to the teacher for planning purposes. The actual time required for each module will vary from class to class and from child to child depending on the needs of the students and the teacher's judgment.

Priorities of Performance Objectives

There is an order of priority to be recognized in teaching the content presented in the CIMS NEW YORK CITY MATHEMATICS CURRICULUM. Performance objectives with the greatest priority are so basic that unless the student acquires a satisfactory degree of competency in them, the student cannot progress. Such topics are marked A and mastery by all pupils is essential.

Performance objectives marked B are required to be presented to all students. Mastery is not expected at this time. These objectives will be developed further and reinforced later.

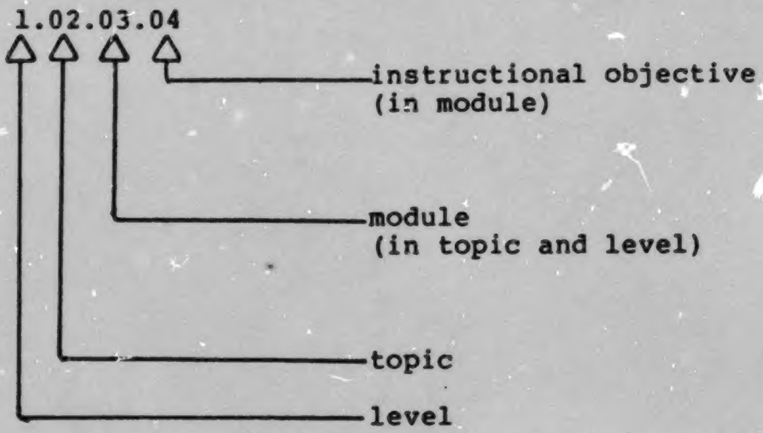
Performance objectives marked C are of special interest. These should be taught to increase positive attitudes towards mathematics.

Summary: A - Mastery of this objective is essential for progress. Opportunities for reinforcement should be provided throughout the school year.
B - These objectives are to be taught to all pupils. Mastery is not essential at this time because the topics will be further developed and reinforced.
C - Objectives of special interest.

Topic Tab Key

01. Numbers and Numeration
02. Addition of Whole Numbers
03. Subtraction of Whole Numbers
04. Multiplication of Whole Numbers
05. Division of Whole Numbers
06. Fractions
07. Decimals
08. Integers
09. Geometry
10. Measurement
11. Algebraic Concepts
12. Graphs, Probability, Statistics
13. Problem Solving
14. Review

Module Coding Key


1.02.03.04
instructional objective
(in module)
module
(in topic and level)
topic
level

INSTRUCTIONAL SEQUENCE DESCRIPTION

An instructional sequence is given in list form on the following pages for this level. The sequence has been arranged to reflect what is considered the most effective presentation of the mathematics curriculum. Each module in the list is described by its unit number, module number, title, and page location.

The CIMS tests are integrated within the manual sequence. The test number is located in the first column. Each test is designed to assess priority objectives from the preceding modules. The tests are used to determine student mastery of specific performance objectives within these modules and appear in a multiple choice format. Each performance objective code number preceded by an * indicates that the performance objective is not tested on a CIMS test.

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INSTRUCTIONAL SEQUENCE - LEVEL 3

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
	1	3.14.01	Basic facts	1
	2	3.10.01	Days and dates on a calendar	2
	3	3.12.01	Bar graphs	4
	4	3.04.01	The identity element (1) for multiplication and the role of zero	5
3.01	5	3.04.02	Multiplication facts	6
	6	3.05.01	Concepts of division	7
	7	3.10.02	Measurement - time	8
	8	3.06.01	Equivalent fractions	10
3.02	9	3.10.03	Weight in customary units	12
	10	3.10.04	Weight in metric units	13
	11	3.14.02	Place value and expanded notation through 999	14
	12	3.01.01	Count by tens and hundreds	15
	13	3.01.02	Round 2- and 3-digit numbers to the nearest ten/hundred	16
	14	3.01.03	Place value through 9,999	18
3.03	15	3.02.01	Addition of 3-digit numbers	20
	16	3.02.02	Addition of 3-digit numbers with one regrouping (exchange) ones to tens	21
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	18	3.03.01	Subtraction with one regrouping (exchange) tens to ones	24
	19	3.04.03	Multiplication of twos	25
3.04	20	3.04.04	Multiplication of fives	26
	21	3.05.02	Division of whole numbers (for twos through 18, for fives through 45)	27
	22	3.13.01	Guess and check	28

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INSTRUCTIONAL SEQUENCE - LEVEL 3

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
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	24	3.02.03	Addition of 2-digit numbers with one regrouping (exchange) tens to hundreds	30
	25	3.02.04	Addition of 3-digit numbers with two regroupings (exchange) ones for tens, tens for hundreds	31
	26	3.03.02	Subtraction with one regrouping (exchange) hundreds to tens	32
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	28	3.04.05	Multiplication of threes and fours	34
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	30	3.06.02	Non-unit fractional parts	36
	31	3.10.06	Recognize and compare relationships (five dollars and ten dollars)	37
	32	3.09.02	Open and closed figures and curves	38
	33	3.13.02	Locate information	39
	34	3.06.03	Addition and subtraction of fractions (like denominators)	40
	35	3.04.06	Multiplication of sixes and sevens	41
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INSTRUCTIONAL SEQUENCE - LEVEL 3

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3.02.03 ADDITION OF 2-DIGIT NUMBERS WITH ONE REGROUPING (EXCHANGE) TENS TO HUNDREDS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.02.03.01B add two 2-digit numbers with regrouping (exchange) in vertical and horizontal formats and check;

e.g.,

```
                                  check
   9 3       93 + 25 = 118         118
 + 2 5                            - 25
 -----                            ----
 1 1 8                              93
```

3.02.03.02B solve word problems related to skills learned in this module.

e.g.,

Joey had 90 marbles. His brother gave him 87 more. How many marbles does he have now?

```
                               check
    9 0                         177
 +  8 7                        - 87
 ------                        ----
  1 7 7  marbles                 90
```

3.02.03

VOCABULARY

TERMS

exchange
regroup
vertical
horizontal

Prepare pairs of cards with 1-digit addition examples written in the vertical form, e.g., $\boxed{\begin{array}{r}2\\+6\\\hline 8\end{array}}$ and the horizontal form, e.g., $\boxed{2 + 6 = 8}$.

Display one pair of cards. Say, "What is the same on these cards? What is different?" (One example is written up and down, and the other is written sideways.) Hold up the first card, $\boxed{\begin{array}{r}2\\+6.\\\hline 8\end{array}}$ Say, "When an example is written this way, we say it is in the vertical form." Write the example on the chalkboard with the word vertical printed next to it. Hold up the second card, $\boxed{2 + 6 = 8}$. Say, "When an example is written this way, we say it is in the horizontal form." Write the example on the chalkboard with the word horizontal printed next to it.

Repeat this procedure using other cards.

Ask students to write the following example as you say it, e.g., 10 + 12. Write the example on the chalkboard in vertical form, $\begin{array}{r}10\\+12\\\hline\end{array}$.

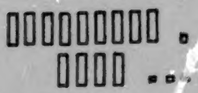
Say, "How many of you wrote the example this way?" On the other side of the chalkboard write the example in horizontal form, $10 + 12 = \square$. Repeat the question. Say, "If you wrote the example the first way, you wrote it in the vertical form. If you wrote the example the second way, you wrote it in the horizontal form." Ask students to add both examples. Say, "Are the answers the same? The form in which we write the example does not affect the answer." Repeat this procedure using other examples.

3.02.03

3.02.03.01 **add two 2-digit numbers with regrouping (exchange) in vertical and horizontal formats and check**

STRATEGY 1: Prepare and distribute squared material. Write $\begin{array}{r}91\\+43\\\hline\end{array}$ on the chalkboard. Say, "Use your material to show this example."

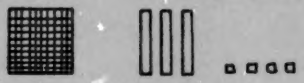
e.g., $\begin{array}{r}91\\+43\\\hline\end{array}$



Say, "Add the units. e.g., ▫ + ▫▫▫ = ▫▫▫▫ Add the strips of ten." e.g., ▯▯▯▯▯▯▯▯▯ + ▯▯▯▯ = ▯▯▯▯▯▯▯▯▯▯▯▯▯

Say, "Regroup 10 strips of ten for 1 square of one hundred. Show the answer using your material."

e.g., $\begin{array}{r}91\\+43\\\hline 134\end{array}$



Repeat this procedure using the same example in horizontal format. Say, "Either format will give the same sum. How can we check that the sum is correct?" (subtract one addend from the sum)

STRATEGY 2: Prepare two sets of cards with the same 2-digit numbers in each set, one addition symbol, one subtraction symbol and a set of sum cards.

e.g., $\boxed{52}$ $\boxed{52}$ $\boxed{+}$ $\boxed{63}$ $\boxed{63}$ $\boxed{115}$

Ask three students to stand next to each other and give each one a card. Ask three other students to come to the front of the room and give each a card. Ask the first student to stand holding the first addend card, the second to sit on a chair holding the second addend card and the third to hold the addition symbol between the two. Say, "Copy both examples, the first being horizontal and the second being vertical. Add the digits in the ones place and write your answer. Add the digits in the tens place. How many tens do we have? Can we regroup the tens to make hundreds? (yes) Regrouping tens is like regrouping ones. The one hundred formed by

STRATEGY 2: cont'd

regrouping 10 tens can be recorded directly in the sum since there are no hundreds to add."

e.g.,

```
  52
 +63
 115
```

Say, "To check the answer we form a subtraction example." Rearrange the students holding the cards. Exchange the addition symbol for the subtraction symbol and add the sum card. Say, "The sum is correct since the check works."

Repeat this procedure.

3.02.03.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Prepare and distribute a supply of menus. Read the different headings on the menu, e.g., Sandwiches, Desserts. Say, "Look at the menu and decide what you might like to order." Ask a student to tell what he/she might like to order. Write the items and the cost on the chalkboard. Say, "How much do you think this will cost?" Ask students to estimate and then do the computation. Complete the example by putting the dollar and cents symbols in their correct positions. Check the estimates.

Repeat this procedure.

STRATEGY 2: Write the following on the chalkboard.

> Today, our class is going to the movies. Each of us will buy 1 ticket. A ticket costs ______. We will also buy popcorn and soda. We need _____ for 1 box of popcorn and ____ for 1 soda. How much money will each person in our class need for this trip?

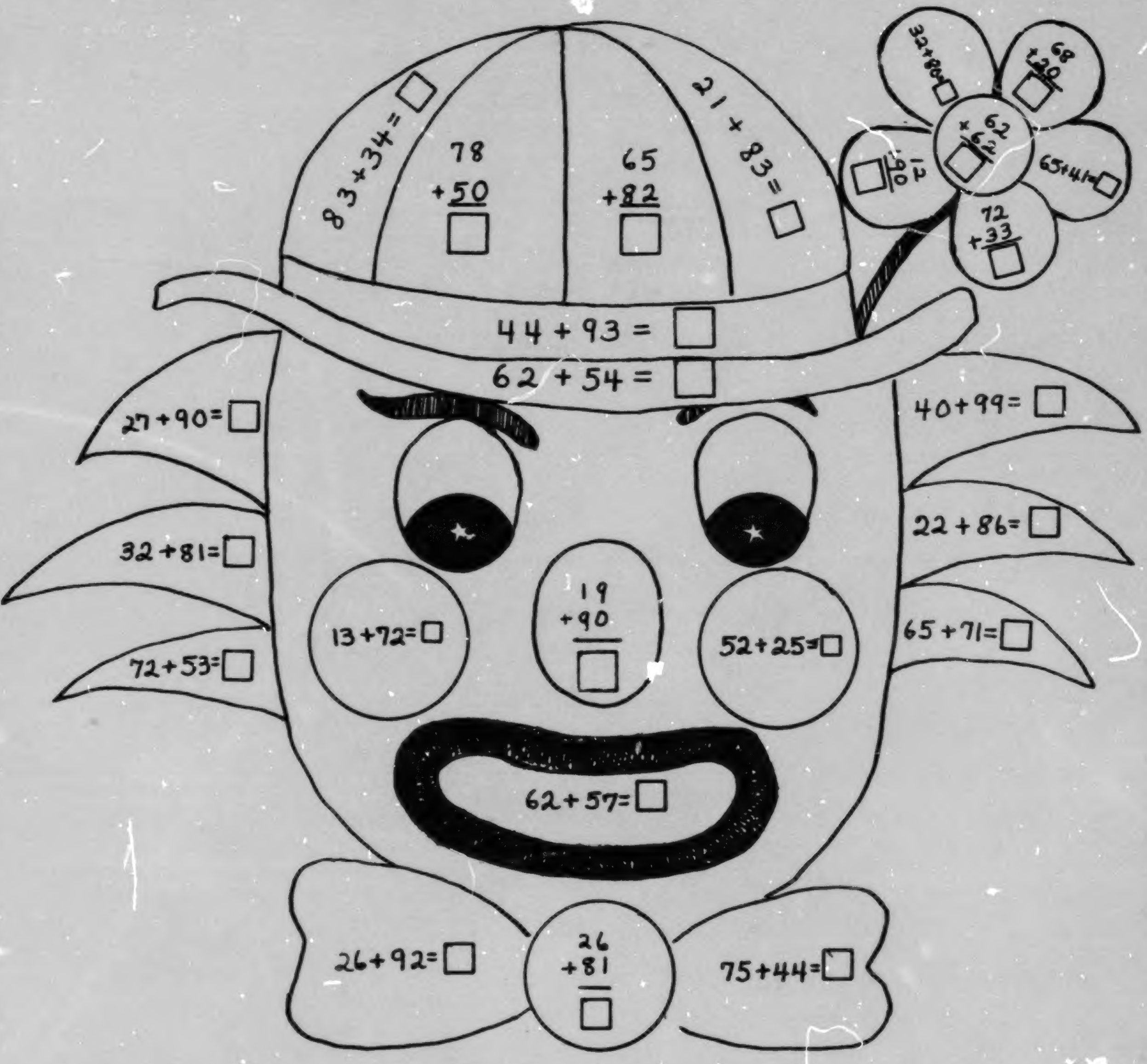
Ask the students to fill in the blanks. Say, "What operation must we use in order to complete the problem?" Write the three prices on the chalkboard, and ask the students to add them.

Repeat this procedure.

P.O. 3.02.03.01

NAME: ______________________ **CLASS:** ________ **DATE:** ________

Add. Use the answer key to color the examples.

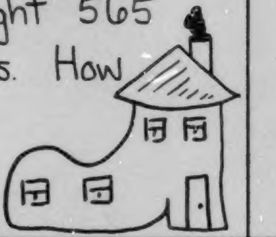
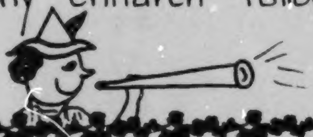

83+34=☐
78 +50 ☐
65 +82 ☐
21+83=☐
32+80=☐
68 +20 ☐
62 +62 ☐
12 +90 ☐
65+41=☐
72 +33 ☐
44+93=☐
62+54=☐
27+90=☐
40+99=☐
32+81=☐
22+86=☐
72+53=☐
65+71=☐
13+72=☐
19 +90 ☐
52+25=☐
62+57=☐
26+92=☐
26 +81 ☐
75+44=☐

Red	Blue	Green	Yellow	
85	117	118	113	102
77	139	129	108	112
109	116	125	137	88
119	122	136	104	106
128		147	105	
107		124		

P.O. 3.02.03.02

NAME: ____________________ CLASS: ________ DATE: ________

Solve each story problem. Use addition by regrouping.

	Work Here
Jack the candlestick jumper, jumped over 315 candles on Monday. He jumped over 292 candles on Tuesday. How many candles did he jump over in all?	
Mary had 375 lambs. She bought 154 more. How many lambs does she have in all?	
The old woman who lived in a shoe bought dinner for her children. She bought 565 hamburgers and 352 frankfurters. How many did she buy in all? 	
Humpty Dumpty fell off the wall. His head broke into 468 pieces. His body broke into 291 pieces. How many pieces did Humpty Dumpty break into in all?	
The Pied Piper had 280 children follow him one day. The next day 455 children followed him. How many children followed him in all? 	

3.02.04 ADDITION OF 3-DIGIT NUMBERS WITH TWO REGROUPINGS (EXCHANGES) ONES FOR TENS, TENS FOR HUNDREDS

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.02.04.01A add two or more 3-digit numbers with two regroupings (exchanges), ones for tens, tens for hundreds and check;

e.g.,

$$\begin{array}{rrrr} & \underline{\text{check}} & & \underline{\text{check}} \\ 263 & 431 & 242 & \underline{714} \\ \underline{+168} & \underline{-168} & 108 & 242 \\ 431 & 263 & \underline{+364} & 108 \\ & & 714 & +364 \end{array}$$

3.02.04.02B compute addition examples having sums to \$9.99 with two regroupings (exchanges) and check;

e.g.,

$$\begin{array}{rr} & \underline{\text{check}} \\ \$1.83 & \$4.31 \\ \underline{+2.48} & \underline{-2.48} \\ \$4.31 & \$1.83 \end{array}$$

3.02.04.03A solve word problems related to skills learned in this module.

e.g.,

Bill and Bob drove 394 miles in one day. On the next day, they drove 116 miles. How many miles did they travel altogether?

$$\begin{array}{lr} & \underline{\text{check}} \\ 394 & 510 \\ \underline{+116} & \underline{-116} \\ 510 \text{ miles} & 394 \end{array}$$

3.02.04

VOCABULARY

TERMS

decimal point
dollar sign
regroup
exchange

GETTING STARTED

Set up a "store" in the classroom with items not to exceed $5. The items could include a pencil, a sharpener, a small notebook, ... Supply each child with play coins up to $.99. Say, "You can 'buy' anything you want with the money you have." Ask each student to record the items that they bought and the amount they spent on a piece of paper. Ask some students to be cashiers and check the purchases of the other students.

Write a word problem on the chalkboard, e.g., Joey has 63 marbles. Jack gave Joey 49 more. How many marbles does Joey have?

Ask the students to write the example for the problem, estimate the answer and then solve it. Ask a student to come to the chalkboard and show his work. Say, "There are two ways to write the example, horizontally and vertically." Ask another student to show the other format of the written example.

e.g.,

Student # 1	Student # 2
$\begin{array}{r} 63 \\ \underline{+49} \\ 112 \end{array}$	63 + 49 = 112

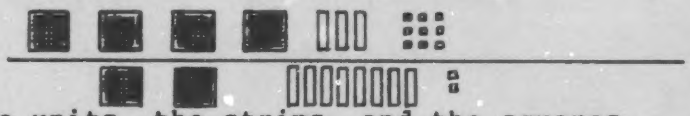
Say, "Who can explain how we arrived at this sum?" (We had to regroup ones as tens.) Ask a student to come to the chalkboard and write the check for this example.

3.02.04

3.02.04.01 **add two or more 3-digit numbers with two regroupings (exchanges), ones for tens, tens for hundreds and check**

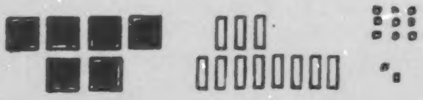
STRATEGY 1: Prepare and distribute squared material. Write an example on the chalkboard. Say, "Show the representation of each addend using the squared material."

e.g., $$\begin{array}{r}439\\ \underline{+282}\end{array}$$



Say, "Add the units, the strips, and the squares. In which places must we regroup? (ones and tens) Why?" (We can't show more than 9 in any place.) Ask the students to show the sum using the squared material.

e.g., $$\begin{array}{r}439\\ +282\\ \hline 721\end{array}$$



Say, "How can we check our answer?" (subtraction example) Ask a student to come to the chalkboard to show the check.

STRATEGY 2: Prepare a set of 3-digit number cards, an addition sign card, blank cards and crayons.

e.g., [176] [+] [356] [ ]

Ask three students to come to the front of the classroom. Give one number card to each of two students and the symbol card to the third. Arrange the students so the cards are in a vertical format (one student may be sitting). Arrange the students to show a horizontal format. Say, "The sum will be the same in either format." Ask a fourth student to come to the front of the room. Give him/her the blank answer card and a crayon. Solve the example with the students. Ask the fourth student to write the answer on the blank card. Say, "We need to check our example. How can we do this?" (subtract

STRATEGY 2: cont'd

one addend from the sum) Ask the students to write the check in their notebooks next to the example.

e.g.,

$$\begin{array}{r} 167 \\ +356 \\ \hline 523 \end{array} \qquad \begin{array}{r} 523 \\ -356 \\ \hline 167 \end{array}$$

Repeat this procedure.

3.02.04.02 **compute addition examples having sums to $9.99 with two regroupings (exchanges) and check**

STRATEGY 1: Prepare a shopping list for a party. List the items needed and the approximate cost. Ask each student to choose two items and compute the amount they will spend.

e.g.,

Item	Cost of Each
Can of fruit juice	$1.15
Box of pretzels	.79
Box of cookies	1.98

Say, "John will buy pretzels and cookies for the party. How much will he spend?" Write the example on the chalkboard.

e.g.,

$$\begin{array}{r} \$\ .79 \\ +1.98 \\ \hline \$2.77 \end{array}$$

Say, "How can John be sure the cookies cost $1.98?" (subtracting the cost of the pretzels from the total cost)

STRATEGY 2: Write items such as hamburger $1.65, frankfurter $.90, orange juice $.65, ice cream $.70, popcorn $.50, potato chips $.35 on the chalkboard. Ask the students to decide what they want to eat and add the cost. Ask a student to give his/her selections and the total cost. Write the selections and costs on the chalkboard. Ask another student to add the cost. Say, "How can we check to make sure our

STRATEGY 2: cont'd

total cost is correct?" (add upwards)

e.g.,

		check
hamburger	$1.65	$2.65
potato chips	.35	.65
orange drink	+ .65	.35
Total	$2.65	.65

Repeat this procedure with other students.

3.02.04.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write this problem on the chalkboard.

> Louis had $4.99. He earned $3.55. How much did Louis have altogether?

Say, "What does the problem tell us? How would we solve the problem?" Ask a student to write the example on the chalkboard. Ask another student to solve and check.

e.g.,

	check
$4.99	$8.54
+ 3.55	- 4.99
$8.54	$3.55

Repeat this procedure using similar problems.

STRATEGY 2: Write a word problem on the chalkboard.

e.g,

> The third and fourth grade classes were invited to see a play in the school auditorium. There are 283 students in the third grade, and 318 students in the fourth grade. How many students were invited to the play?

Ask the students to solve the problem in their notebooks. Ask one student to write the example in vertical format on the chalkboard, and another to solve it. Ask another student to write the example in horizontal format on the chalkboard, and another student to solve it and check.

Repeat this procedure using other word problems.

P.O. 3.02.04.01

NAME: ______________________ CLASS: __________ DATE: __________

Can you solve the mystery message? Add each example. Match each answer to a letter. Place the letter over the same number in the message. Solve the message.

343 +269	127 +483	121 185 +128	414 +187
312 162 +159	519 +286	378 +245	526 +275
408 +396	183 214 +165	297 +475	
324 +243	532 +178	216 134 +482	

601	A
801	D
772	F
612	H
562	I
805	M
610	N
434.	O
837	O
623	S
622	T
710	T
633	U
804	!

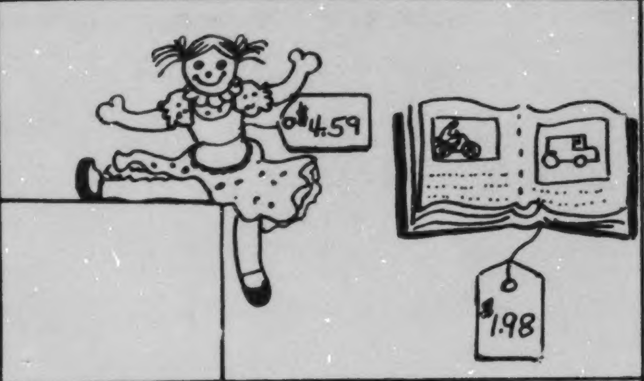
805 601 622 612   562 623   772 633 610

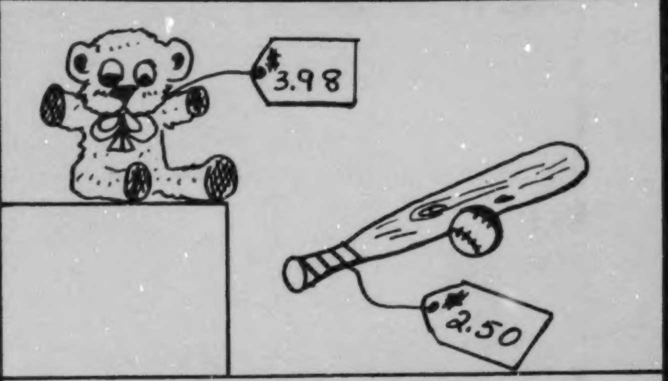
710 434   801 837 804

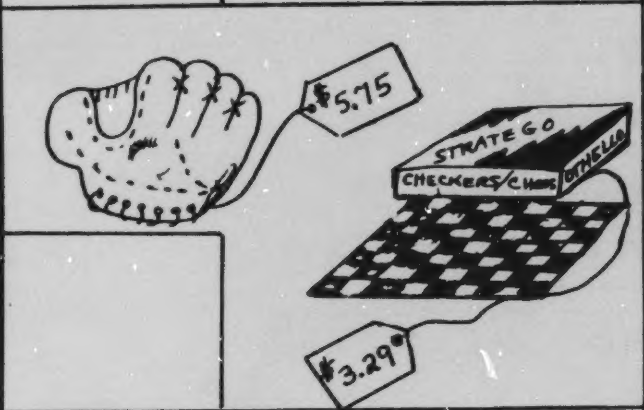
P.O. 3.02.04.02

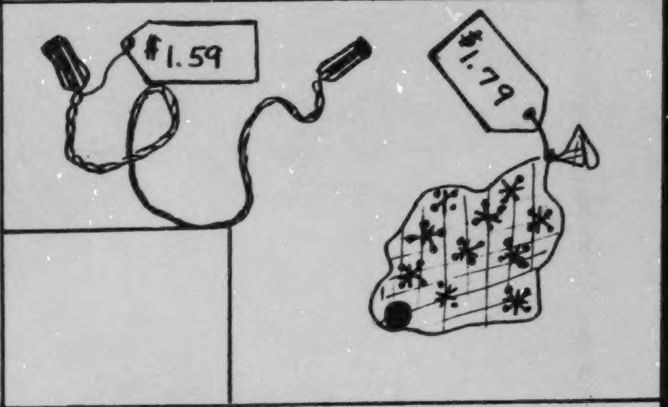
NAME: ______________________ **CLASS:** __________ **DATE:** ________

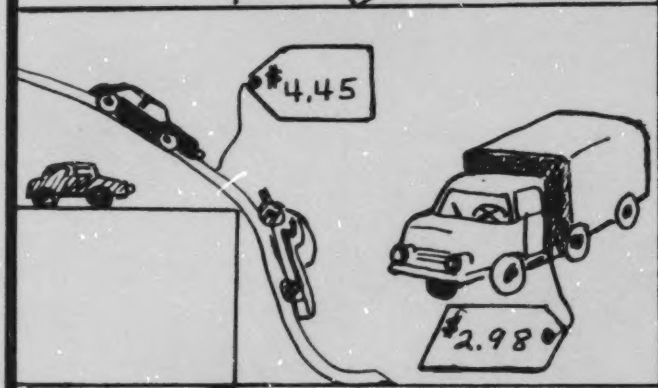
How much would you pay for each group of toys.
Write your answer in the box.

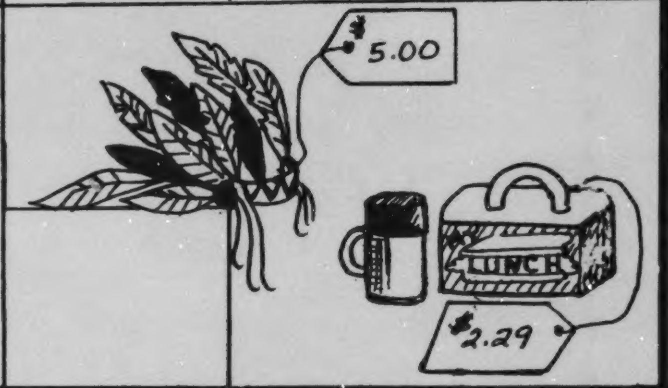


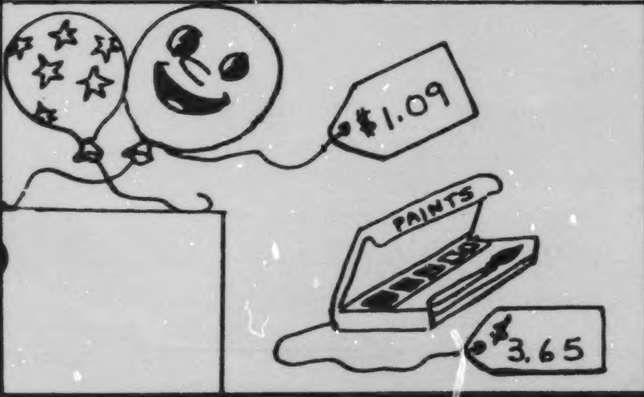


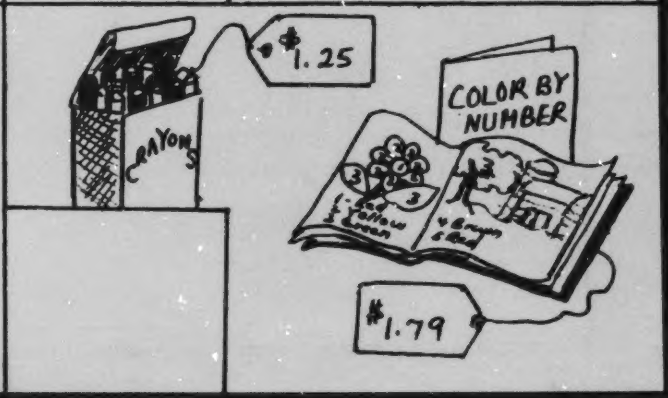

$5.75
STRATEGO
CHECKERS/CHESS
OTHELLO
$3.29






$5.00
LUNCH
$2.29

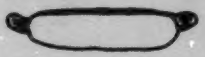

$1.09
PAINTS
$3.65


$1.25
CRAYONS
COLOR BY NUMBER
$1.79

P.O. 3.02.04.03

NAME:______________________________ CLASS:________ DATE:________

Solve the following word problems.
Show all of your work.

On Saturday, 356 tickets were sold to the fair. On Sunday, 285 tickets were sold. How many tickets were sold on both days?	Work Space check
John sold 287 boxes of popcorn. Jimmy sold 336 boxes of popcorn. How many boxes of popcorn were sold in all?	check
Mark sold 516 soda drinks. Mary sold 394 soda drinks. How many soda drinks were sold in all?	check
The clown gave 438 balloons to the children on Saturday. He gave 299 balloons to the children on Sunday. How many balloons did he give out in all?	check
Mr. Brown sold 383 frankfurters. Ms. Brown sold 249 frankfurters. How many frankfurters were sold in all? 	check

3.03.02 SUBTRACTION WITH ONE REGROUPING (EXCHANGE) HUNDREDS TO TENS

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.03.02.01B subtract up to 4-digit numbers with one regrouping (exchange) of hundreds to tens and determine if the difference is odd and check;

e.g.,

$$\begin{array}{r} {\scriptstyle 1\ 14} \\ \cancel{2}\cancel{4}9 \\ -158 \\ \hline 91 \end{array} \qquad \begin{array}{r} \text{check} \\ 91 \\ +158 \\ \hline 249 \end{array} \qquad\qquad \begin{array}{r} {\scriptstyle 3\ 18} \\ 6\cancel{4}\cancel{8}7 \\ -2295 \\ \hline 4192 \end{array} \qquad \begin{array}{r} \text{check} \\ 4192 \\ +2295 \\ \hline 6487 \end{array}$$

91 is an odd number.

4192 is an even number.

3.03.02.02B compute subtraction examples with one regrouping (exchange) having minuends to $99.99 and check;

e.g.,

$$\begin{array}{r} {\scriptstyle 8\ \ 15} \\ \$4\cancel{9}.\cancel{5}0 \\ -\ 5.70 \\ \hline \$43.80 \end{array} \qquad \begin{array}{r} \text{check} \\ \$43.80 \\ +\ 5.70 \\ \hline \$49.50 \end{array}$$

3.03.02.03B solve word problems related to skills learned in this module.

e.g.,

Patrick traveled 135 miles. The city to which he is traveling is a total of 209 miles from his home. How many more miles does he still have to travel?

$$\begin{array}{r} {\scriptstyle 1\ 10} \\ \cancel{2}\cancel{0}9 \\ -135 \\ \hline 74 \end{array} \text{ miles}$$

3.03.02

VOCABULARY

TERMS

odd
even
difference

GETTING STARTED

Write the following examples on the chalkboard.

$$\begin{array}{rrrr} 63 & 80 & 53 & 43 \\ \underline{-24} & \underline{-29} & \underline{-28} & \underline{-16} \end{array}$$

Say, "How can we subtract 24 from 63?" Elicit from the students that you must regroup 1 ten as 10 ones in order to subtract 24 from 63. Ask one student to complete the subtraction. Ask the remaining students to complete the rest of the examples in their notebooks. Ask three students to complete the examples at the chalkboard. Remind students to check their subtraction by addition.

Write these numbers on the chalkboard.

75 32 86 31 19 60

Say, "We will circle all the odd numbers with red chalk and all the even numbers with blue chalk." Ask a student to circle the first number. Say, "Why is this number odd?" Elicit from students that 5 is an odd number, therefore, 75 is also an odd number. Repeat this procedure with the remaining numbers.

3.03.02

3.03.02.01 **subtract up to 4-digit numbers with one regrouping (exchange) of hundreds to tens and determine if the difference is odd and check**

STRATEGY 1: Prepare squared material. Write the following example on the chalkboard.

$$\begin{array}{r} 452 \\ \underline{-182} \end{array}$$

Ask a student to come to the chalkboard to subtract the ones column. Ask another student to subtract the tens column. Say, "You cannot subtract 8 tens from 5 tens." Use demonstration size squared material to regroup 4 hundreds as 3 hundreds and 10 tens. Say, "Now we are able to subtract 8 from 15." Complete the subtraction. Say, "How can we check our answer?" (Addition is the inverse or opposite operation.) Write $\begin{array}{r} 271 \\ \underline{+182} \end{array}$ on the chalkboard. Ask a student to add. Say, "Is the sum the same as the minuend? Then we know our difference is correct. Is the difference odd or even? How do we know?" (If the number in the ones place is even, the difference is even. If the number in the ones place is odd, the difference is odd.)

Repeat this procedure using other examples.

STRATEGY 2: Write the following example on the chalkboard.

$$\begin{array}{r} 42 \\ \underline{-26} \end{array}$$

Ask a student to come to the chalkboard to complete the subtraction. Ask another student to check the answer using addition. Write the following example on the chalkboard.

$$\begin{array}{r} 420 \\ \underline{-260} \end{array}$$

STRATEGY 2: cont'd

Say, "This example is solved in the same way as the first example except we are now regrouping hundreds as tens." Ask one student to complete the subtraction and check.
Write the following example on the chalkboard.

$$\begin{array}{r} 6420 \\ \underline{-3260} \end{array}$$

Say, "This example is solved in the same fashion as the previous examples. Is the difference even or odd?" (An odd number in the ones place means that the difference is odd and an even number in the ones place means that the difference is even.)

Repeat this procedure.

3.03.02.02 **compute subtraction examples with one regrouping (exchange) having minuends to $99.99 and check**

STRATEGY 1: Adapt Strategy 1 used in P.O. 3.03.01.02 for subtraction with one regrouping from hundreds to tens.

STRATEGY 2: Say, "What kinds of clothing do you need for winter weather?" Make a list of some of the items mentioned. Ask the students to give an approximate price for the items selected. Select an ad for an article of clothing, e.g., a winter jacket from both a high price store and a lower priced store. Ask student to read the price of each. Say, "In which store does the jacket cost more? What must we do in order to find out how much money you will save if you buy the jacket in store A?" (subtract) Ask a student to write the subtraction example on the chalkboard. Repeat this procedure using other examples.

3.03.02.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

Jose had 638 baseball cards. He
gave 242 to his brother. How many
baseball cards did he have left?

Say, "What does this problem ask us? What is the key word? What process must we use?" Ask a student to come to the chalkboard to find the difference, and label the answer. Ask another student to check the example by using addition.

Repeat this procedure using other word problems.

STRATEGY 2: Say, "Who can help me? I had 2329 pennies. I put 1150 pennies in penny rolls and brought them to the bank. I need to know how many pennies I have now, but I don't have time to count them. How can I find out?" Ask a student to come to the chalkboard, write the example and solve the problem. Ask another student to check the example using addition. Ask students to write their own subtraction problems using numbers which require regrouping from hundreds to tens. Ask several students to come to the chalkboard and write their examples and checks.

P.O. 3.03.02.01

NAME: ______________________ CLASS: __________ DATE: __________

Subtract. Use the code to find the message.

CODE

383	463	130	451	394	171	261	494	482	150	140
R	E	U	L	Y	T	V	H	O	M	A

788 -394	967 -485	603 -473		438 -298	666 -283	746 -283

832 -692		742 -592	535 -395	343 -172	888 -394

923 -773	330 -190	979 -596	733 -472	729 -266	902 -451

P.O. 3.03.02.02

NAME: ______________________ CLASS: __________ DATE: ________

Subtract to find the sale price.

$74.50

amount off $23.70

sale price $50.80

$ 74.50
- 23.70
$ 50.80

$16.25

amount off $ 3.70

sale price $ ________

$62.75

amount off $10.95

sale price $ ________

$96.45

amount off $31.75

sale price $ ________

$18.75

amount off $ 6.95

sale price $ ________

$62.50

amount off $25.70

sale price $ ________

$49.50

amount off $15.90

sale price $ ________

P.O. 3.03.02.03

NAME:______________________________ CLASS:__________ DATE:________

Use the information on the chart to solve the problems.

This chart shows the number of caps collected at P.S. 31.

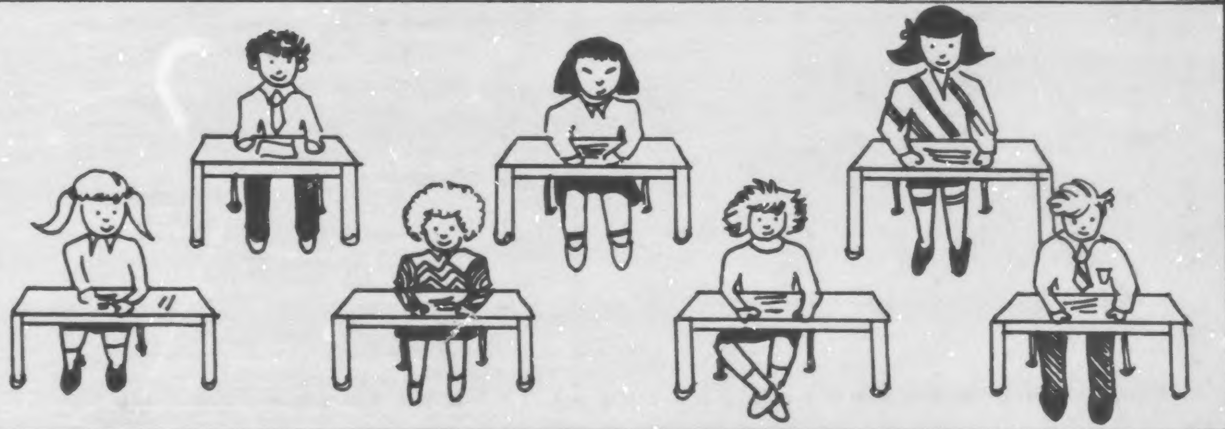
Bottle Caps

First Grade	2538	Fourth Grade	5697
Second Grade	4719	Fifth Grade	3842
Third Grade	3482	Sixth Grade	6550

1. How many more bottle caps did the third grade collect than the second grade?______________

2. How many more bottle caps did the sixth grade collect than the fourth grade?______________

3. How many more bottle caps did the second grade collect than the first grade?________________



Unit 27

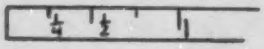
3.10.05 INCH, FOOT, YARD

(3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.10.05.01B identify $\frac{1}{4}$ inch on the 12-inch (1 foot) ruler;
e.g.,



*3.10.05.02A identify a foot as a unit of length and measure objects to the nearest foot;
e.g.,

> How many feet long is the teacher's desk to the nearest foot? ____

*3.10.05.03A identify a yard as a unit of length and measure objects to the nearest yard;
e.g.,

> How many yards long is our classroom to the nearest yard?

3.10.05.04A identify the numerical relationship among inch, foot and yard.
e.g.,

12 inches = 1 foot
3 feet = 1 yard
36 inches = 1 yard

3.10.05

VOCABULARY

TERMS

measure
inch
foot
yard
ruler

GETTING STARTED

Divide the class into small groups. Ask each group to measure various objects using non-standard measures, e.g., measure the width of a table using hands as the instrument of measure. Ask each child in the group to measure at least one object. Be sure that each group measures the same items using the same measures, e.g., the width of the table with hands.

Draw a chart on the chalkboard.
e.g.,

How wide is your table? (hands) Results

Group	1	2	3	4	5

Compare the results. Say, "Since people have hands of different sizes, hands are not reliable units of measure."

Prepare and distribute a one inch cardboard strip and one sheet of paper to each student. Say, "Guess the measurement of your workbook. Now measure the book using the strip. Place the strip end to end. Write the results on your papers." Draw this chart on the chalkboard, and ask the students to copy it into their notebooks.

Note: Do not use the word inch.

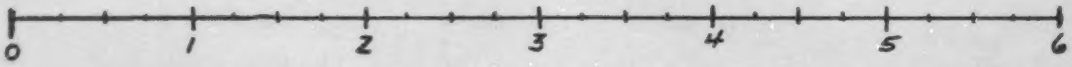
	OBJECTS	GUESS	HOW MANY STRIPS?
width	Math Workbook		

3.10.05

3.10.05.01 **identify $\frac{1}{4}$ inch on the 12 inch (1 foot) ruler**

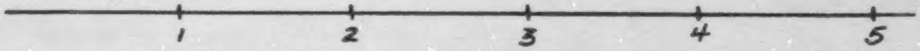
STRATEGY 1: Prepare and distribute a marked cardboard strip, 6 to 12 inches long, to each student.

e.g.,



Draw a similar drawing on the chalkboard, but mark off only the inches.

e.g.,



Say, "This is a model of a ruler. What is the unit of measurement on this ruler?" (an inch) Write the numeral 1 where 1 inch would be on the ruler. Say, "This is one inch. Suppose I were to divide the inch into 2 equal parts. What would each part be called?" ($\frac{1}{2}$ inch) Mark and label the drawing. Say, "Now divide each half in half. What is each part called?" ($\frac{1}{4}$ inch) Mark and label. Continue this procedure for $\frac{3}{4}$, $1\frac{1}{4}$ and $1\frac{1}{2}$. Ask the students to label their model rulers.

STRATEGY 2: Prepare and distribute to each student a 12-inch ruler with fractional markings. Draw a 12-inch ruler on the chalkboard. Using the ruler on the chalkboard, measure various objects to the nearest $\frac{1}{4}$ inch, e.g., pencil, crayon. Ask the students to do the same with their rulers and record in their notebooks the results for each object measured.

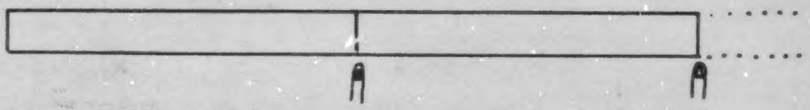
Repeat this procedure using various classroom objects.

3.10.05

3.10.05.02 **identify a foot as a unit of length and measure objects to the nearest foot**

STRATEGY 1: Prepare and distribute a 12-inch ruler to each student. Ask a student to measure a desk top using his/her ruler. Say, "Some things are small enough to be measured using one ruler. How can we measure the desk top?" (We lay down the ruler more than once, keeping our place each time.) Demonstrate the procecure.

e.g.,



Say, "What other things are more than 1 foot?" (the distance between two desks or height) Ask the students to measure various objects or distances to the nearest foot using a 12-inch ruler, and record the results, e.g., height, desk top, width of a radiator, bulletin board, chalkboard.

STRATEGY 2: Prepare a set of index cards with the names of various objects in the classroom, e.g., desk top, width of a chalkboard. Ask the students to guess each measurement to the nearest foot. After the guesses are made, ask a student to actually measure the object or distance using a 12-inch ruler.

Repeat this procedure.

3.10.05

3.10.05.03 **identify a yard as a unit of length and measure objects to the nearest yard**

STRATEGY 1: Ask the students to name objects measured in inches, e.g., clips, books, and measured in feet, e.g., table top, width of a window. Say, "Suppose you needed to find the measurement of the length of the room. Could this be done with a 12-inch ruler?" (Yes, but it would take too long.) Display a yardstick. Say, "A yard equals 36 inches or 3 feet."

Ask the students to estimate various lengths or distances in yards, e.g., the length of the classroom. Ask other students to measure the area using the yardstick. Ask the students to name other objects outside of the classroom which can be measured in yards, e.g., carpeting, fences.

STRATEGY 2: Prepare and distribute an oaktag strip that is one yard long and a 12-inch ruler. Ask the students to label the strip using the 12-inch ruler. Ask the students to mark each inch with a small line.

Write the following on the chalkboard.

1) our classroom
2) a window ledge
3) the length of the chalkboard
4) the height of a bookcase

Ask the students to copy the four items in their notebooks, measure each item using their oak tag yardsticks, and record the number of yards each item measures. Record the students' responses on the chalkboard chart.

3.10.05

3.10.05.04 **identify the numerical relationship among inch, foot and yard**

STRATEGY 1: Display a representation of an inch, a foot and a yard. Ask the students to use the measurements to discover the following relationships, 12 inches = 1 foot, 3 feet = 1 yard. Write the relationships on the chalkboard.

STRATEGY 2: Divide the students into groups. Prepare and distribute representations of an inch, a foot and a yard to each group. Show the relationship on the chalkboard.

e.g.,

___ inches = 1 foot

___ feet = 1 yard

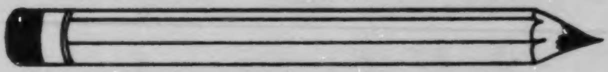
___ inches = 1 yard

Ask each group to use their lengths to determine the number to write in each blank. Record the students' findings on the chalkboard.

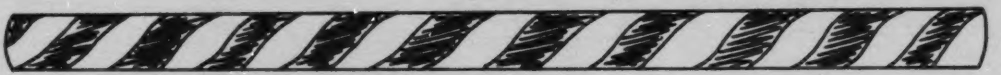
P.O. 3.10.05.01

NAME:____ CLASS:_________ DATE:________

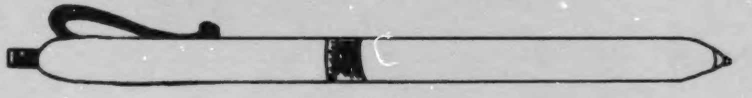
1. Use your ruler. Measure each length to the nearest ¼ inch.
2. Draw line segments that measure:



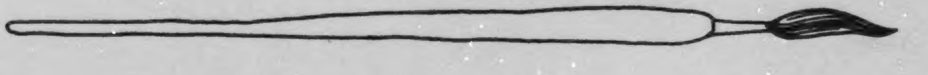
______ inches



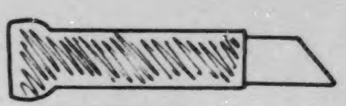
_____ inches



_____ inches



_____ inches



_____ inches

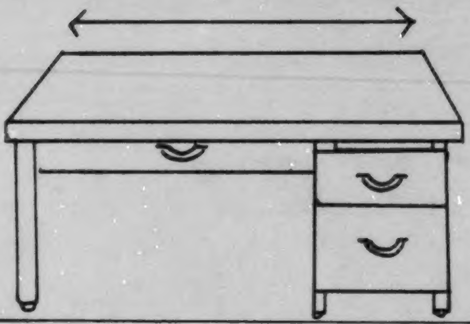
Draw line segments that measure:

1. $2\frac{3}{4}$ inches
2. $5\frac{1}{4}$ inches
3. $1\frac{2}{4}$ inches
4. $4\frac{3}{4}$ inches
5. $2\frac{1}{2}$ inches
6. $3\frac{1}{4}$ inches

P.O. 3.10.05.02

NAME:_______________________________**CLASS:**__________**DATE:**________

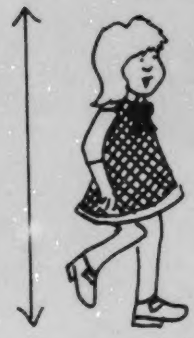
1. Guess the length of each item in feet.
2. Measure each item.
3. Write your answer to the nearest foot.



Width of teacher's desk

_____ft. guess

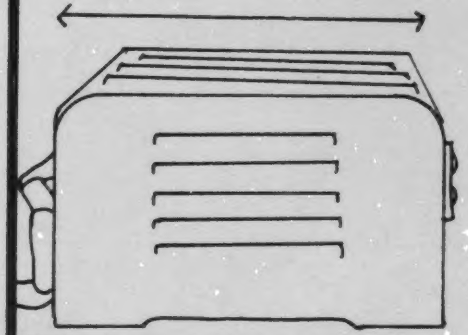
_________ft. actual length



Your neighbor's height

_______ft. guess

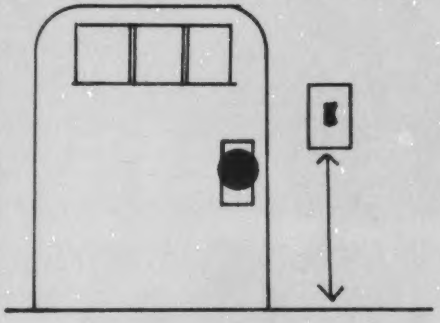
__________ft. actual length



Width of radiator

______ft. guess

___________ft. actual length



Distance from floor to
light switch.

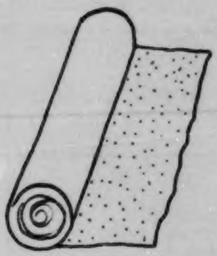
_______ft. guess

___________ft. actual distance

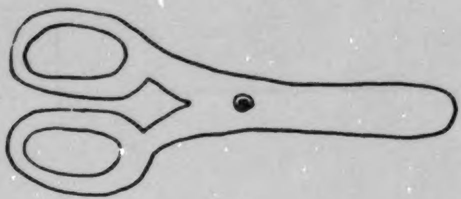
P.O. 3 10.05.03

NAME: ______________________ CLASS: __________ DATE: ________

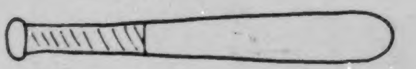
Write yes or no to tell if each thing should be measured in yards.



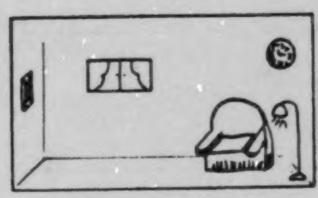
carpet ________



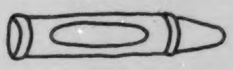
length of scissors ________



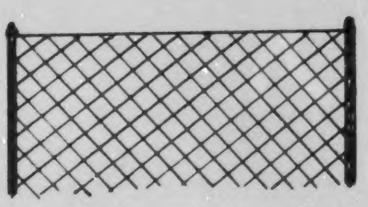
baseball bat ________



length of a room ________



crayon ________



width of a fence ________

P.O. 3.10.05.04

NAME: ______________________ CLASS: __________ DATE: __________

1. List objects that are usually measured in inches; feet; yards.
2. Fill in the blanks.

Things Measured in Inches	Things measured in feet	Things measured in yards
Pencil	Table	Carpet

12 inches = ______ ft.

24 inches = ______ ft.

36 inches = ______ yds.

3.04.05 MULTIPLICATION OF THREES AND FOURS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.05.01A multiply three by the numbers one (1) through nine (9), using vertical and horizontal formats;

e.g.,

$$\begin{array}{r} 3 \\ \times\ 1 \\ \hline 3 \end{array} \qquad \begin{array}{r} 3 \\ \times\ 2 \\ \hline 6 \end{array} \qquad \begin{array}{r} 3 \\ \times\ 3 \\ \hline 9 \end{array}$$

$1 \times 3 = 3$
$2 \times 3 = 6$
$3 \times 3 = 9$

3.04.05.02A multiply four (4) by the numbers one (1) through nine (9), using the vertical and horizontal formats;

e.g.,

$$\begin{array}{r} 4 \\ \times\ 1 \\ \hline 4 \end{array} \qquad \begin{array}{r} 4 \\ \times\ 2 \\ \hline 8 \end{array} \qquad \begin{array}{r} 4 \\ \times\ 3 \\ \hline 12 \end{array}$$

$1 \times 4 = 4$
$2 \times 4 = 8$
$3 \times 4 = 12$

3.04.05.03B apply the commutative property of multiplication to the 3 and 4 times table;

e.g.,

$3 \times 6 = 18$ $\qquad$ $4 \times 6 = 24$
$6 \times 3 = \square$ $\qquad$ $6 \times 4 = \square$

3.04.05.04A solve word problems related to skills learned in this module.

e.g.,

If 6 girls each buy 3 apples, how many apples will they buy in all?

$6 \times 3 = 18$ apples

3.04.05

VOCABULARY

TERMS	SYMBOLS
multiply	X
vertical	
horizontal	
commutative property	

GETTING STARTED

Prepare a set of flash cards for the 2 and 5 times table. Vary the format in which the examples are written, e.g., 2 x 5 = and $\begin{array}{r}2\\ \underline{\times 5}\end{array}$. Divide the class into two groups. Have each group line up on opposite sides of the classroom. Present the card to the first student of Group A. Instruct the student to read and complete the number sentence. If he/she responds correctly then he/she walks to the back of the line. If an incorrect response is given, the student returns to his/her seat. Present the next card to the first person of Group B. Repeat this activity until all of the members of one group are seated.

Prepare a set of 9 x 12 oak tag cards. Card one should have one triangle, card two should have two triangles..., card 9. Display card one. Say, "What shape is this? (triangle) How many sides does it have? (3) How many triangles? (1) How many sides in all?" (3) Draw a chart on the chalkboard.

e.g.,

Number of Triangles	Number of Sides
1	3

Record responses on the chart. Display the rest of the cards and repeat the procedure. Record the information on the chart. Ask the students to copy the chart into their notebooks.

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3.04.05

3.04.05.01 **multiply three by the numbers one (1) through nine (9) using vertical and horizontal formats**

STRATEGY 1: Distribute 27 plastic discs to each student. Write the following on the chalkboard: 1 x 3 = _____. Say, "What does this equation ask us?" Elicit from the students that we must find out what 1 group of 3 equals. Ask the students to use their discs to make 1 group of 3. Say, "How many discs do we have?" Write on the chalkboard, 1 x 3 = 3. Repeat this procedure using sets of 3 (2 x 3...9 x 3). Explain to the students that there are two ways of writing multiplication facts e.g., 1 x 3 and $\begin{array}{r} 3 \\ \underline{x1} \end{array}$. Ask students to come to the chalkboard and write the facts of three horizontally and vertically.

STRATEGY 2: Adapt Strategy 1 used in P.O. 3.04.04.02 for multiplying by threes.

3.04.05.02 **multiply four (4) by the numbers one (1) through nine (9), using the vertical and horizontal formats**

STRATEGY 1: Give each student a sheet of graph paper. Ask the students to color two sets of four squares. Say, "How many squares are colored? (8) What multiplication sentence describes the picture?" (2 x 4 = 8) Write the equations 2 x 4 = 8 and $\begin{array}{r} 4 \\ \underline{x2} \\ 8 \end{array}$ on the chalkboard. Ask two students to read the examples.

Repeat this procedure using other facts of four.

STRATEGY 2: Ask four students to come to the front of the classroom and stand in a row. Ask another four students to stand behind the first group. Say, "How many rows? (two) How many in each row? (four)

STRATEGY 2: cont'd

How many in all? (eight) What multiplication sentence describes the students?" Write the equation 2 x 4 = 8 and $\begin{array}{r}4\\ \times 2\\ \hline 8\end{array}$ on the chalkboard. Ask two students to read the examples.

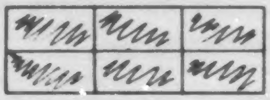
Repeat this procedure using other facts of four.

3.04.05.03 **apply the commutative property of multiplication to the 3 and 4 times table**

STRATEGY 1:

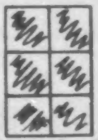
Distribute one sheet of one inch squared graph paper to each student. Write on the chalkboard 2 x 3 = ☐. Say, "Use a crayon to fill in the boxes on your graph paper to illustrate this equation." Demonstrate this on the chalkboard.

e.g.,



Say, "Count the number of boxes you have filled in." Elicit from the students that 2 x 3 = 6, therefore, 6 boxes were filled in. Say, "Now use a crayon to fill in the boxes on your graph paper to illustrate this equation: 3 x 2 = ☐. Demonstrate this on the chalkboard.

e.g.,



Say, "Count the number of boxes you have filled in." Elicit from students that 3 x 2 = 6, therefore, 6 boxes were filled in. Repeat this procedure using other multiplication examples. Elicit from students the definition of the commutative property as applied to multiplication. Ask students to come to the chalkboard to write the commutative pairs for the three and four times tables.

STRATEGY 2: Adapt Strategy 2 used in P.O. 3.04.05.02 for the three and four times tables.

3.04.05.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the steps for solving word problems on the chalkboard. Read the problem, find the key words, decide on the operation, estimate the answer, solve and compare the answer and the estimate.

Write the following on the chalkboard: 3 x 3 = ☐. Say, "Who will give us a word problem which can be solved using this open sentence?"
e.g.,

> Three boys have three marbles each. How many marbles do they have altogether?

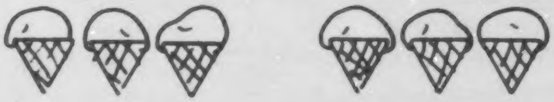
Repeat this procedure using other open sentences with facts of three and four.

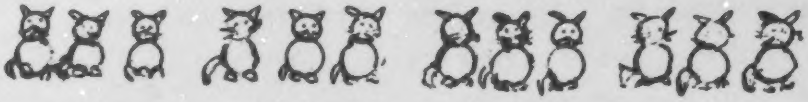
STRATEGY 2: Adapt Strategy 1 used in P.O. 3.04.03.03 for solving word problems involving multiplying threes and fours.

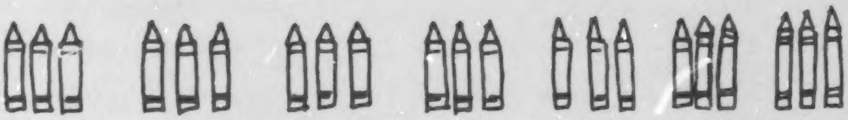
P.O. 3.04.05.01

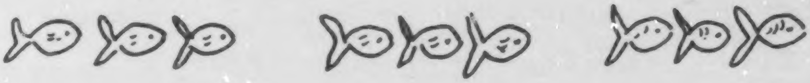
NAME: ______________________ **CLASS:** ________ **DATE:** ________

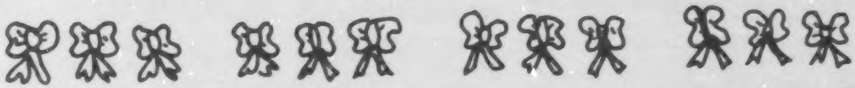
1. Write the multiplication fact and the product for each illustration.
2. Rewrite these facts in a different way and solve.

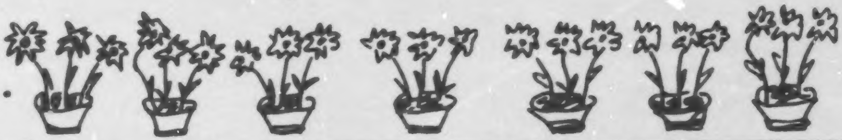
1.  ________

2.  ________

3.  ________

4.  ________

5.  ________

6.  ________

$$\begin{array}{r}3\\ \times 4\\ \hline\end{array}$$ ________

$$\begin{array}{r}3\\ \times 9\\ \hline\end{array}$$ ________

$$\begin{array}{r}3\\ \times 3\\ \hline\end{array}$$ ________

$$\begin{array}{r}3\\ \times 8\\ \hline\end{array}$$ ________

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P.O. 3.04.05.02

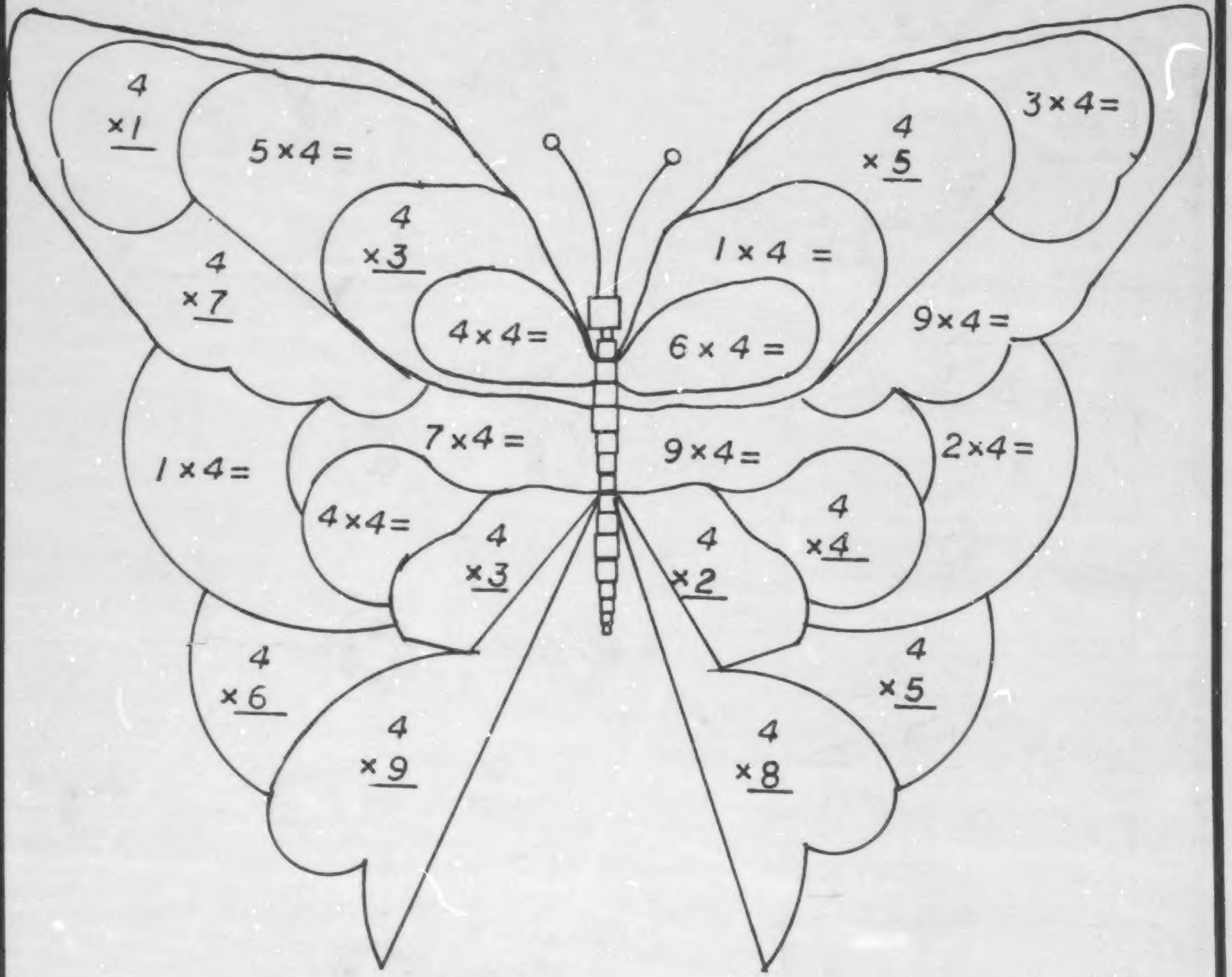
NAME:____________________ CLASS:__________ DATE:________

Multiply. Use the chart to color the butterfly.

color products 4,8 or 12 red

color products 16, 20 or 24 blue

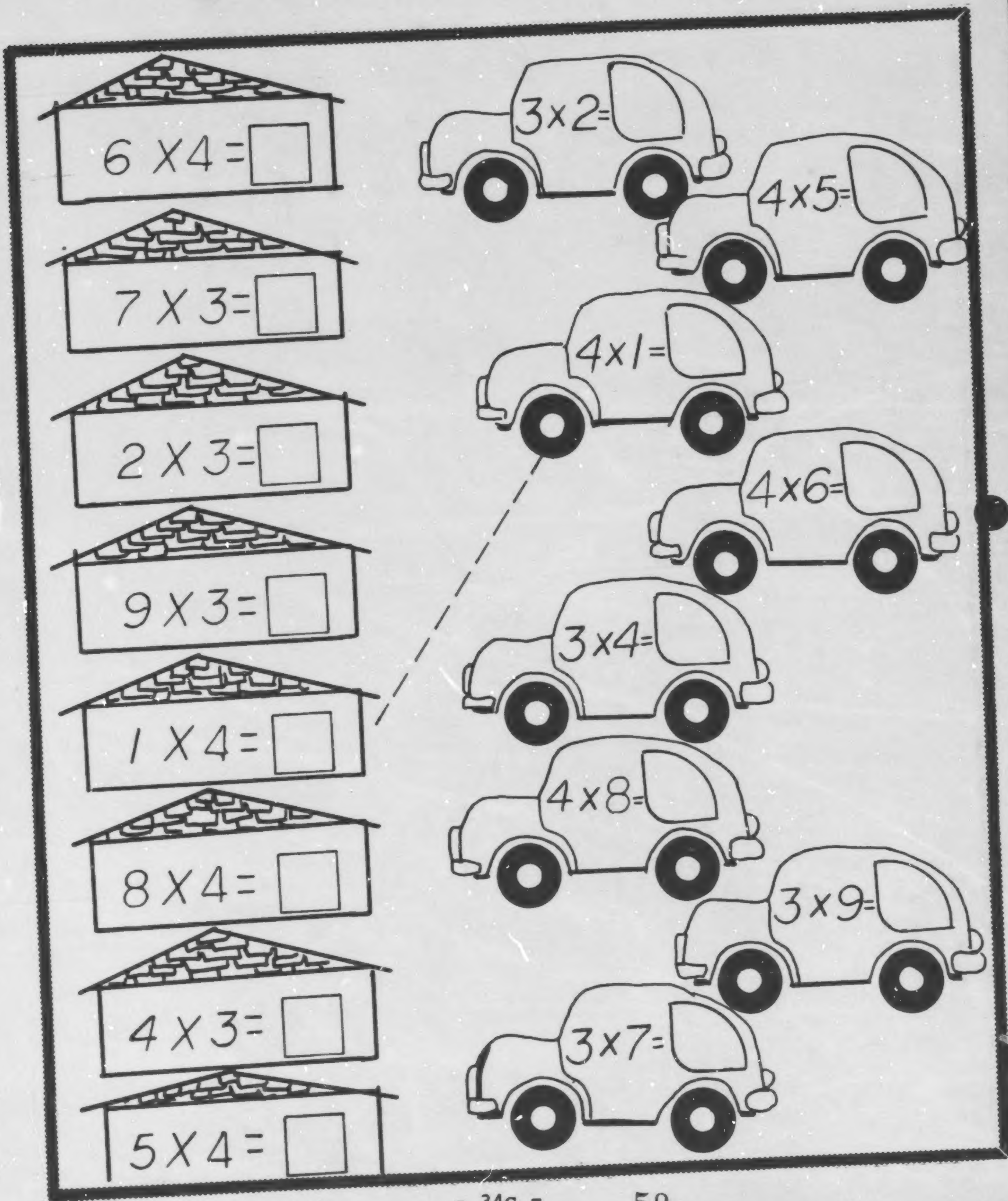
color products 28 32 or 36 yellow


4 × 1
5 × 4 =
4 × 3
4 × 7
4 × 4 =
3 × 4 =
4 × 5
1 × 4 =
6 × 4 =
9 × 4 =
7 × 4 =
9 × 4 =
1 × 4 =
2 × 4 =
4 × 4 =
4 × 3
4 × 2
4 × 4
4 × 6
4 × 9
4 × 8
4 × 5

P.O. 3.04.05.03

NAME: ______________________________ **CLASS:** __________ **DATE:** ________

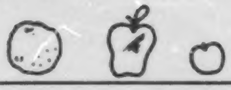
Park each car in its own garage and fill the box.


6 X4 = ☐
7 X 3= ☐
2 X 3= ☐
9 X 3= ☐
1 X 4= ☐
8 X 4= ☐
4 X 3= ☐
5 X 4 = ☐
3x2=
4x5=
4x1=
4x6=
3x4=
4x8=
3x9=
3x7=

P.O. 3.04.05.04

NAME: ____________________ CLASS: ________ DATE: ________

Solve and check each problem.

	Work Here
Mary has five brothers. Each brother has four toy cars. How many toy cars are there in all?	
John, Tom and Mike went to the movies. They each bought a box of popcorn and a soda. How many things did they buy in all?	
Jane and her three friends, Mary, Sue and Sally went to the fruit store. Jane bought 3 apples. Mary bought 3 oranges. Sue and Sally bought 3 plums each. How many fruits did they buy in all? 	
Tony bought 8 pencils. Each pencil cost 4¢. How much did Tony spend in all?	
A tricycle has 3 wheels. How many wheels do 9 tricycles have?	

3.05.03 DIVISION OF WHOLE NUMBERS (THREES THROUGH 27, FOURS THROUGH 36)

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.03.01A divide by 3, having dividends up to 27, without a remainder;
e.g.,

$$27 \div 3 = 9 \qquad \begin{array}{r} 9 \\ 3\overline{)27} \end{array} \qquad \frac{27}{3} = 9$$

3.05.03.02A divide by 4, having dividends up to 36, without a remainder.
e.g.,

$$36 \div 4 = 9 \qquad \begin{array}{r} 9 \\ 4\overline{)36} \end{array} \qquad \frac{36}{4} = 9$$

3.05.03

VOCABULARY

TERMS	**SYMBOLS**
divide division divisor dividend quotient	$\overline{)\quad}$, ÷, —

GETTING STARTED

Prepare multiplication flashcards for facts of 3, e.g., 3 x 8 = □. Ask the class to stand. Show each student a card. Elicit an immediate response. If they get the answer right, they remain standing. If they miss the fact, they sit down. The last child to remain standing is the winner.

Repeat this procedure using facts of 4.

Say, "We are going to play Buzz." Ask a student to start at one. Ask other students to continue counting to 30. When a student comes to a number that is a multiple of 3, he/she says "Buzz" instead of the number, e.g., one, two, Buzz. The student following says the next number in order. Repeat using 4 as the multiple Buzz number.

3.05.03

3.05.03.01 **divide by 3, having dividends up to 27, without a remainder**

STRATEGY 1: Prepare and distribute 27 interlocking cubes to each student. Say, "We have a 27 car train. We want to make shorter trains. Each train will have 3 cars. How many trains can we make?" Ask a student to make the trains. Say, "How many trains are there? (9 trains) How can we write a number sentence to show this?" Elicit and write the number sentence on the chalkboard.

e.g.,

$$\begin{array}{r} 9 \\ 3\overline{)27} \end{array} \qquad 27 \div 3 = 9 \qquad \frac{27}{3} = 9$$

Say, "Make a 24 car train. How many 3 car trains can we make?" (8) Write the number sentence on the chalkboard.

e.g.,

$$\begin{array}{r} 8 \\ 3\overline{)24} \end{array} \qquad 24 \div 3 = 8 \qquad \frac{24}{3} = 8$$

Repeat this procedure for division facts of 3.

STRATEGY 2: Write $3\overline{)12}$ on the chalkboard. Say, "Division is a short way to subtract. By using subtraction we can find out how many 3's are in 12." Ask a student to repeatedly subtract 3 from 12.

e.g.,

$$\begin{array}{rl} 3\overline{)12} & \\ \underline{-3} & (1) \\ 9 & \\ \underline{-3} & (2) \\ 6 & \\ \underline{-3} & (3) \\ 3 & \\ \underline{-3} & (4) \\ 0 & \end{array}$$

Say, "How many 3's did we subtract from 12? (4 threes) Therefore, $\begin{array}{r} 4 \\ 3\overline{)12} \end{array}$ or $12 \div 3 = 4$ or $\frac{12}{3} = 4$."

Repeat this procedure for the division facts for 3.

3.05.03

3.05.03.02 divide by 4, having dividends up to 36, without a remainder

STRATEGY 1: Prepare 36 coins, chips, beads, ... Ask four students to come to the front of the room and share 16 chips. Say, "How many chips did each student get? (4) How can we write this as a number sentence?" Write it on the chalkboard.

e.g.,

$$4\overline{)16},\ 16 \div 4,\ \frac{16}{4}$$

Repeat this procedure for facts of 4.

STRATEGY 2: Adapt Strategy 1 used in 3.05.03.01 for division by 4.

P.O. 3.05.03.01

NAME: ______________________ CLASS: ________ DATE: ________

Find each quotient.
Match each example to its quotient.

$3\overline{)27}$	$3\overline{)21}$	$3\overline{)18}$
$3\overline{)9}$	$3\overline{)3}$	$3\overline{)15}$
$3\overline{)6}$	$3\overline{)12}$	$3\overline{)24}$

Match each example to its quotient

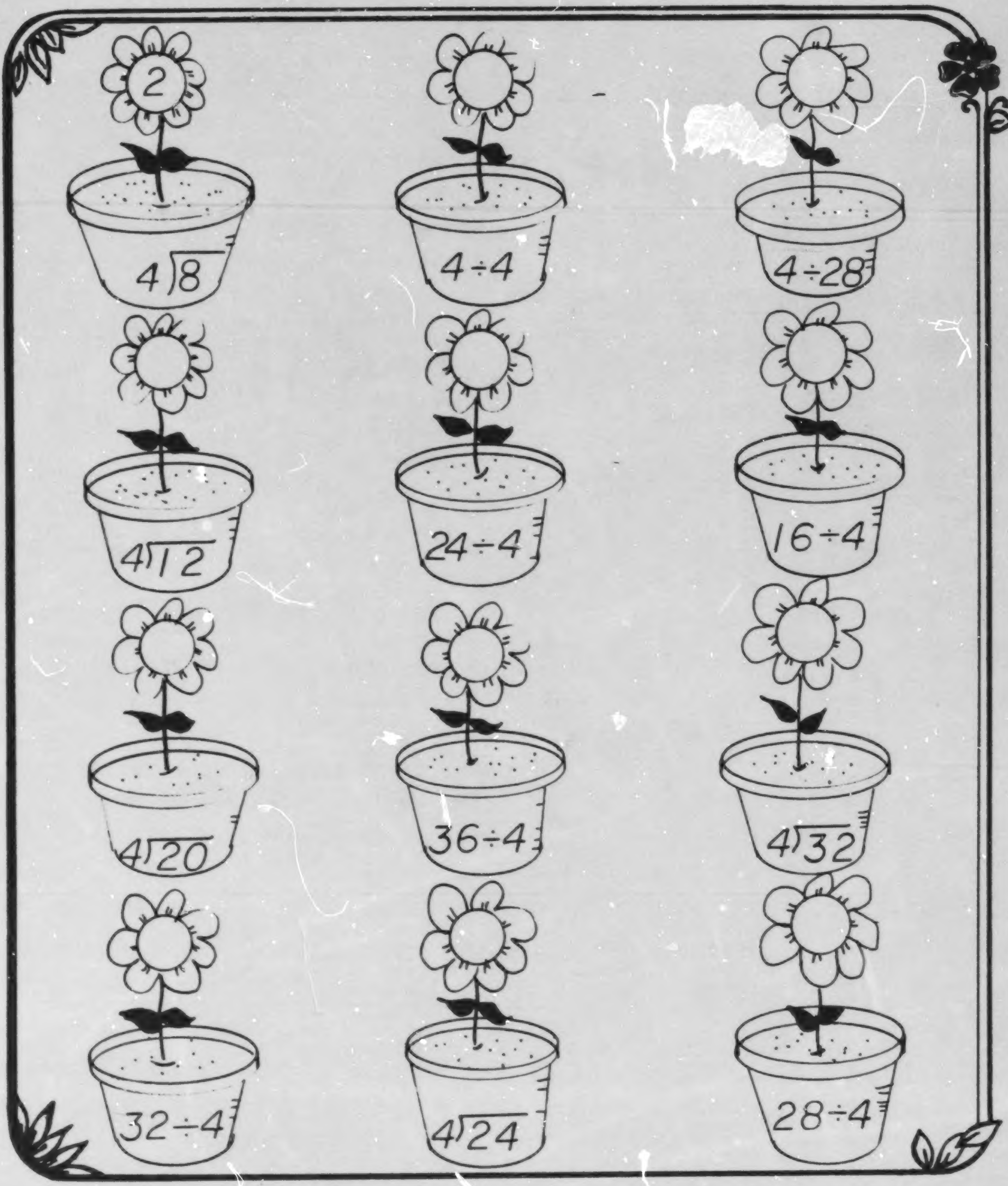
3 ÷ 3 =
12 ÷ 3 =
24 ÷ 3 =
15 ÷ 3 =
21 ÷ 3 =
9 ÷ 3 =
18 ÷ 3 =
27 ÷ 3 =
6 ÷ 3 =

1
2
3
4
5
6
7
8
9

P.O. 3.05.03.02

NAME: ______________________ CLASS: ________ DATE: ________

Write the quotient for each example in the flower.


2
4)8
4÷4
4÷28
4)12
24÷4
16÷4
4)20
36÷4
4)32
32÷4
4)24
28÷4

3.06.02 NON-UNIT FRACTIONAL PARTS

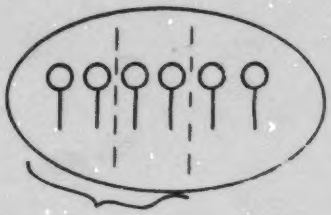
(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.06.02.01B divide a number through 32 into non-unit fractional parts;

e.g.,



$\frac{2}{3}$ of 6 lollipops

3.06.02.02B solve word problems related to skills learned in this module.

e.g.,

Mary baked 12 pies. She must give $\frac{2}{4}$ of the pies to her best friend. How many pies will she give away?

3.06.02

VOCABULARY

TERMS

non-unit fraction

GETTING STARTED

Prepare and distribute 12 discs to each student. Ask the students to divide the discs into 2 equal groups. Say, "What fraction does each group represent? ($\frac{1}{2}$)

Ask the students to divide the discs into 3 equal groups. Say, "How many discs are in each group?" (4) Say, "What fractional part do we call each group?" ($\frac{1}{3}$)

Repeat this procedure using numbers through 32.

Prepare flashcards, e.g., $\boxed{\frac{1}{3}\text{ of }12}$, $\boxed{\frac{1}{4}\text{ of }16}$, $\boxed{\frac{1}{5}\text{ of }20}$, and 20 discs, bottle caps, marbles or chips for each pair of students. Distribute the counters. Show card one to the students. Say, "Place 12 counters on your desk. Divide the counters into three groups. How many counters are in each group? (4) What part of the whole is each group? ($\frac{1}{3}$) What is $\frac{1}{3}$ of 12?" (4)

e.g.,

$\boxed{\frac{1}{3}\text{ of }12}$

0000	0000	0000
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

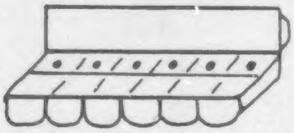
Write $\frac{1}{3}$ of 12 = 4 on the chalkboard. Repeat this procedure using other flashcards.

3.06.02

3.06.02.01 **divide a number through 32 into non-unit fractional parts**

STRATEGY 1: Prepare and distribute egg cartons and 12 counters to each student. Say, "Put a counter into one fourth of the compartments. 12 must be divided evenly by 4 to find one fourth. What is $\frac{1}{4}$ of 12? (3 compartments) How many compartments must be filled to show $\frac{2}{4}$ of 12?" (6)

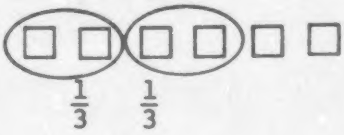
e.g.,



Repeat this procedure using various non-unit fractions through 32.

STRATEGY 2: Prepare and distribute counters to each student. Ask the students to count out 6 counters. Say, "Divide them into 3 equal sets. When you separate the counters into 3 equal sets, you are dividing the counters into thirds. Each set is $\frac{1}{3}$ of the original set. How many counters are there in $\frac{1}{3}$ of 6? (2) If $\frac{1}{3}$ of 6 is 2, what would $\frac{2}{3}$ of 6 be?" (4)

e.g.,



Repeat this procedure using different numbers of counters with non-unit fractions.

3.06.02

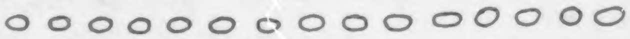
3.06.02.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following word problem on the chalkboard.

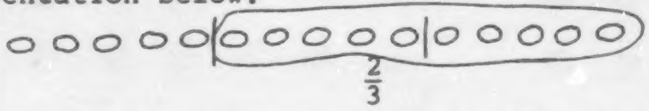
You have 15 cookies.
$\frac{2}{3}$ of them are chocolate.
How many are chocolate?

Say, "Read the problem. What picture shows the problem?" Ask a student to draw the representation.

e.g.,



Say, "How can we find $\frac{2}{3}$ of the group?" Elicit the representation below.



Repeat this procedure using other problems.

STRATEGY 2: Prepare an index card for each student with a word problem written on it.

e.g.,

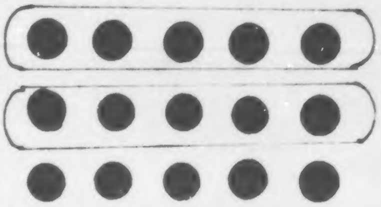
Sue had 24 ribbons.
$\frac{2}{6}$ of the ribbons are red.
How many red ribbons does she have?

Distribute an index card to each student. Ask them to copy the word problem into their notebooks and solve the problem. Ask the students to switch cards as a check.

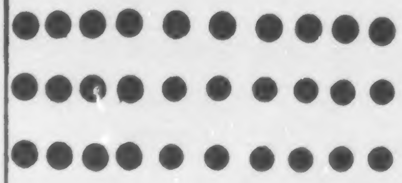
P.O. 3.06.02.01

NAME: ______________________ CLASS: __________ DATE: ________

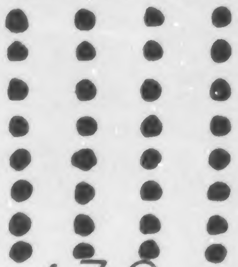
Circle the dots and complete the number sentence.



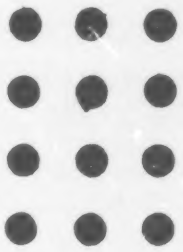
$\frac{2}{3}$ of 15 = 10



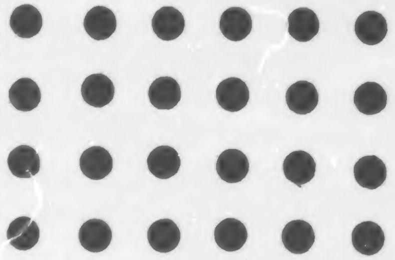
$\frac{2}{3}$ of 30 = _____



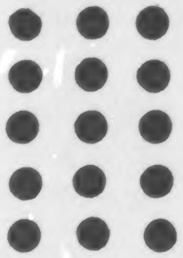
$\frac{3}{8}$ of 32 = _____



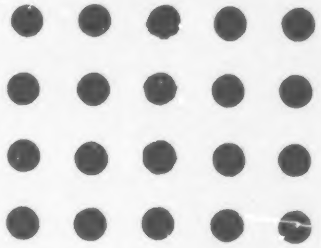
$\frac{2}{4}$ of 12 = _____



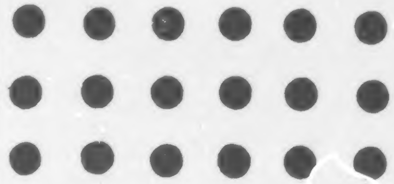
$\frac{3}{4}$ of 24 = _____



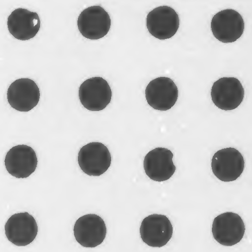
$\frac{2}{5}$ of 15 = _____



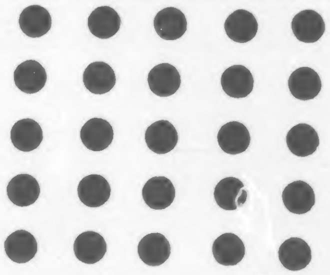
$\frac{2}{4}$ of 20 = _____



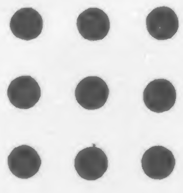
$\frac{2}{3}$ of 18 = _____



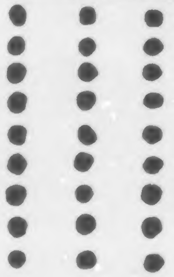
$\frac{3}{4}$ of 16 = _____



$\frac{3}{5}$ of 25 = _____



$\frac{2}{3}$ of 9 = _____

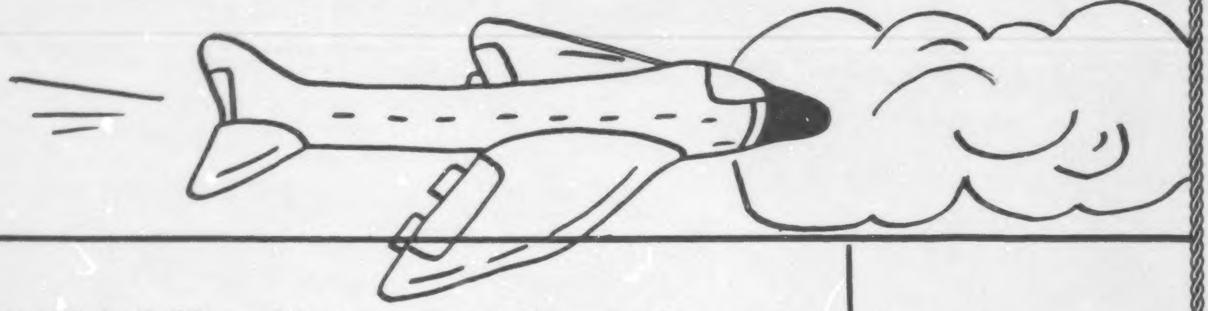


$\frac{5}{9}$ of 27 = _____

P.O. 3.06.02.02

NAME: ______________________ CLASS: ________ DATE: ________

Solve each problem.



David had 15 marbles. 2/5 of the marbles are blue. How many marbles are blue?	
The pet store has 27 animals. 2/3 of the animals are cats. How many cats are there?	
Lori baked 24 cup cakes. She frosted 3/4 of them chocolate. How many chocolate cupcakes did she have?	
The baseball team played 12 games. They won 2/3 of the games. How many games did they win.	
You have 32¢ You owe 2/4 of it to your friend. How much money do you owe your friend?	
There are 20 flowers in the garden. 2/5 of them are roses. How many roses are there?	

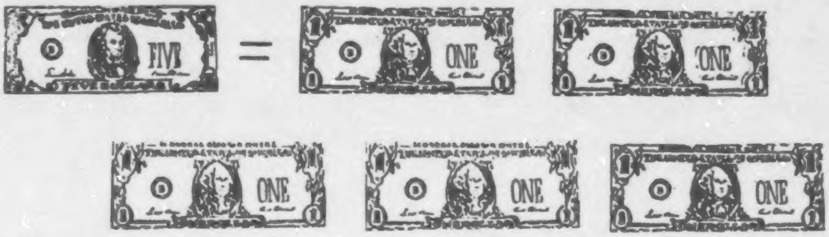
3.10.06 RECOGNIZE AND COMPARE RELATIONSHIPS (FIVE DOLLARS AND TEN DOLLARS)

(1 lesson)

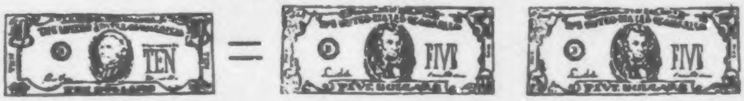
PERFORMANCE OBJECTIVES

The student will be able to...

3.10.06.01B recognize and identify a five dollar bill and its equivalent values; e.g.,


FIVE
=
ONE
ONE
ONE
ONE
ONE

3.10.06.02B recognize and identify a ten dollar bill and its equivalent values. e.g.,


TEN
=
FIVE
FIVE

3.10.06

VOCABULARY

TERMS

coins

GETTING STARTED

Write on the chalkboard: 5 pennies = 1 nickel, 2 nickels = 1 dime, 5 nickels = 1 quarter, 2 quarters = 1 half dollar and 4 quarters = 1 dollar. Say, "These are different ways of having the same amounts of money. They are not the only combinations we can make. What are other combinations?" Elicit from the students other combinations that equal 1 dime, 1 quarter, 1 half dollar and 1 dollar. Say, "We are going to play a game. In this game you must try to use the fewest number of coins to make a given amount of money." Write 38¢ on the chalkboard. Say, "Which coins make 38¢?" Elicit that the fewest number of coins would be 1 quarter, 1 dime and 3 pennies. Repeat this procedure using other amounts of money.

Write the following on the chalkboard.

Pencil	15¢	Paste	25¢
Crayons	30¢	Ruler	50¢
Notebook	79¢	Eraser	20¢

Say, "Make believe you have $1.00 to buy some school supplies. You may buy any items you like as long as you don't spend more than $1.00. Choose your items, add the costs and determine the change you should get after your purchase." Ask several students to do their work on the chalkboard.

3.10.06

3.10.06.01 **identify the value of a five dollar bill and its equivalent values**

STRATEGY 1: Prepare play money. Display the one dollar bill. Say, "This bill has the number 1 on all four corners and on both sides of the bill. It has a picture of President Washington in the center. What is its value?" Display the five dollar bill. Say, "What is different about this bill? It has the number 5 in all four corners and it has a different man's picture. The picture on the five dollar bill is President Abraham Lincoln. Five one dollar bills equal one five dollar bill."

STRATEGY 2: Prepare and distribute play money. Hold up a one dollar bill and a five dollar bill. Ask the students for the value of each bill. Ask a student to count out the number of one dollar bills that are equal to the five dollar bill. (A five dollar bill is equal to five one dollar bills.) Say, "What are the differences between the two bills? (The numbers, values and pictures are different.) Count out the number of one dollar bills equal to one five dollar bill."

3.10.06.02 **recognize and identify a ten dollar bill and its equivalent values**

STRATEGY 1: Prepare play money. Display a $10.00 bill and say, "What number is in each of the four corners? (10) The picture on the ten dollar bill is of Alexander Hamilton. The bill is a ten dollar bill and it is

STRATEGY 1: cont'd

worth $10." Show the students a $1, $5 and $10 bill and say, "All bills are the same shape, size and color. All bills have a number in the corner which tells the value of the bill. One ten dollar bill equals two five dollar bills." Write 5 + 5 = 10 on the chalkboard. Say, "One five dollar bill and five one dollar bills equal one ten dollar bill." Write 5 + 1 + 1 + 1 + 1 + 1 = 10 on the chalkboard. Say, "10 one dollar bills equal one ten dollar bill." Write 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10 on the chalkboard. Ask a student to show these examples using play money.

STRATEGY 2: Prepare play money. Divide the class into groups. Give each group one, five and ten dollar denominations. Hold up a model of a ten dollar bill. Say, "What value does this bill have? ($10) Find a ten dollar bill at your table. Look at the ten dollar bill. What is in each corner? (number 10) What else do you see on the ten dollar bill? (a picture of a man) The man is Alexander Hamilton. What bills do you have at your desk that will have the same value as $10? (two five dollar bills, one five and five one dollar bills or ten one dollar bills) Match the ten dollar bill with bills that are equal to it."

P.O. 3.10.06.01

NAME: ____________________ CLASS: ________ DATE: ______

Past the correct money value on the line.

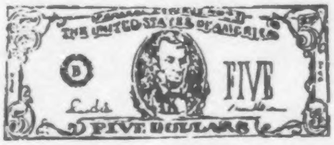
1) $5.00 ____________________

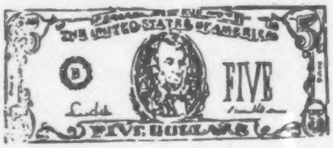
2) five dollar bill ____________________

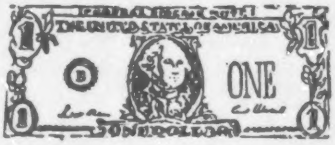
3) How many one dollar bills equal one five dollar bill?

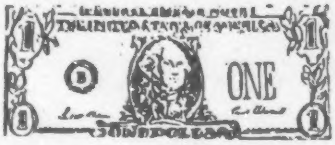
____

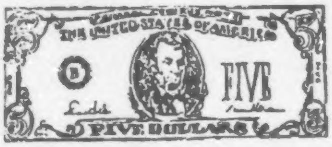
____

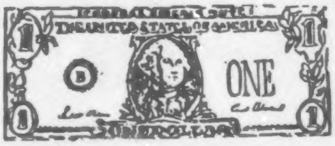

THE UNITED STATES OF AMERICA
FIVE
FIVE DOLLARS

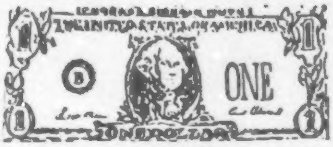

THE UNITED STATES OF AMERICA
FIVE
FIVE DOLLARS

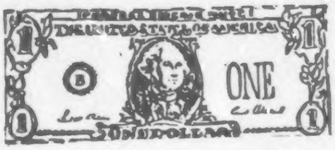

THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR

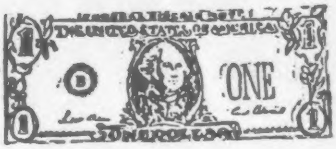

THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR


THE UNITED STATES OF AMERICA
FIVE
FIVE DOLLARS


THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR


THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR

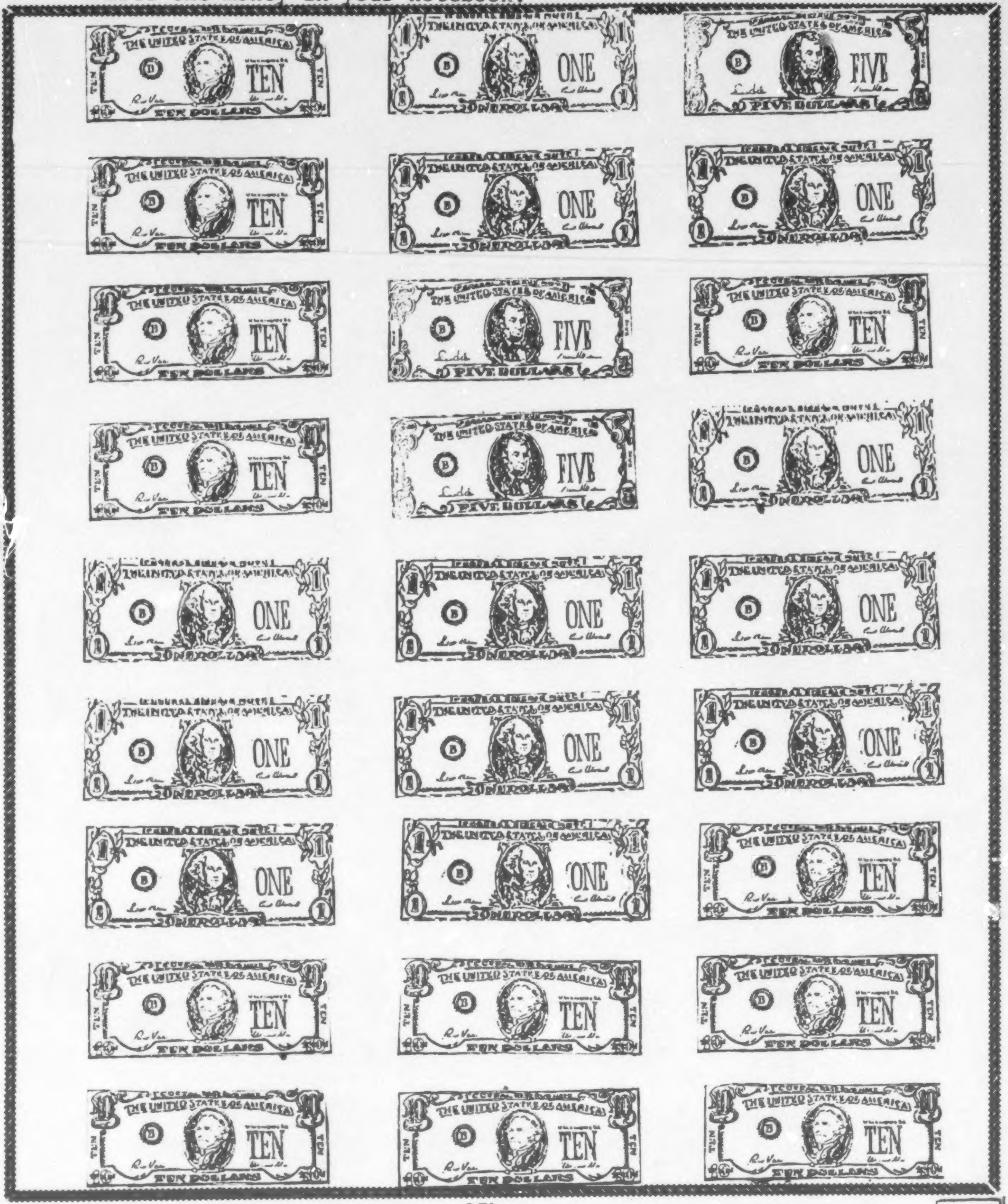

THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR


THE UNITED STATES OF AMERICA
ONE
ONE DOLLAR

P.O. 3.10.06.02

NAME: ______________________________ CLASS: __________ DATE: ________

Cut out the money.
Show all the ways you can make $10.00.
Paste the money in your notebook.



3.09.02 OPEN AND CLOSED FIGURES AND CURVES

(1 lesson)

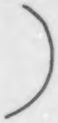
PERFORMANCE OBJECTIVES

The student will be able to...

3.09.02.01B recognize whether a figure is open or closed;

e.g.,

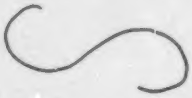
OPEN



CLOSED

3.09.02.02B recognize open and closed curves;

e.g.,

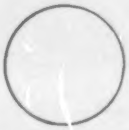


open

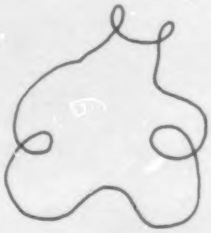
closed

3.09.02.03B recognize simple closed curves and complex closed curves.

e.g.,



simple closed curves



complex closed curves

VOCABULARY

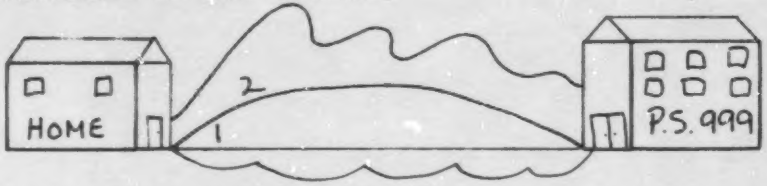
TERMS

open curve
closed curve
simple curve
complex curve

GETTING STARTED

Draw the following sketch on the chalkboard. The paths should be drawn as indicated in the lesson.

e.g.,



Say, "Let's pretend this is your house, and this is our school. There are many different ways for you to walk to school.

You could walk a straight path. (Draw line #1.) You could walk like this if you had more time. (Draw line #2.)

If you walk along this path (point to line 2), will you still get to school?"

Repeat this procedure for paths 3 and 4.

Trace each path with wool. Cut each piece of wool to fit the path exactly. Ask the students to compare the length of the wool for each path. Say, "The curvier the path, the longer the piece of wool."

Divide the class into groups of three (3). Prepare and distribute wool and scissors. Say "Each of you in the group will have a chance to measure a path in at least 3 ways. The paths are from your desk to the door, the trash can to the teacher's desk, and the sink to the door." Allow time for measurement.

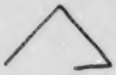
Say, "Which paths were straight? Weren't straight? longest?"

3.09.02

3.09.02.01 **recognize whether a figure is open or closed**

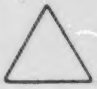
STRATEGY 1: Draw the following sketch on the chalkboard.

e.g.,



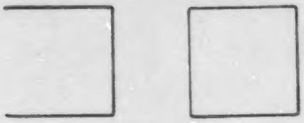
Say, "How can we make this figure a triangle?" Ask a student to change it by closing it up or draw a triangle the way he/she thinks it should appear.

e.g.,



Say, "The original figure is called an open figure and the new one is called a closed figure." Repeat this procedure using other open and closed figures.

e.g.,

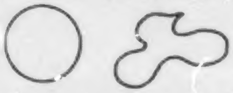


STRATEGY 2: Draw various open and closed figures, e.g., on a set of flash cards and ask the students to state whether the figures are open or closed.

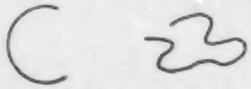
3.09.02.02 **recognize open or closed curves**

STRATEGY 1: Prepare a set of cards as follows.

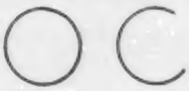
1) These are closed curves.



These are not closed curves.



Which of these are closed curves?



3.09.02

STRATEGY 1: cont'd

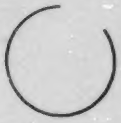
Say, "What do closed curves have in common? What do open curves have in common?" Ask a student to point to the designated pictures and give a reason for his/her answer.

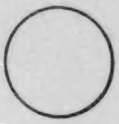
Distribute drawing paper. Ask the students to draw a closed curve and an open curve and label each one.

STRATEGY 2:

Draw two curves on the chalkboard in different colored chalk, one open and one closed.

e.g.,





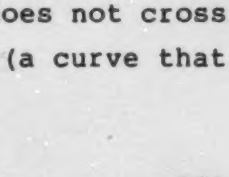
Say, "If the curves were fences, a dog could get out of one, but could not get out of the other. Which curve would hold the dog inside? (the circle) What kind of curve is this?" (closed) Ask a student to name the other curve. Repeat this procedure using other examples of open and closed curves.

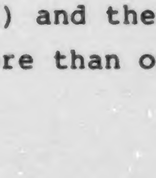
3.09.02.03 **recognize simple closed curves and complex closed curves**

STRATEGY 1:

Draw two curves on the chalkboard.

e.g.,





Say, "Although both are closed curves, one is considered a simple closed curve (a closed curve that does not cross itself) and the other a complex curve (a curve that has more than one enclosed

STRATEGY 1: cont'd region as a result of crossing itself). Curve A is a simple closed curve and B is a complex closed curve."

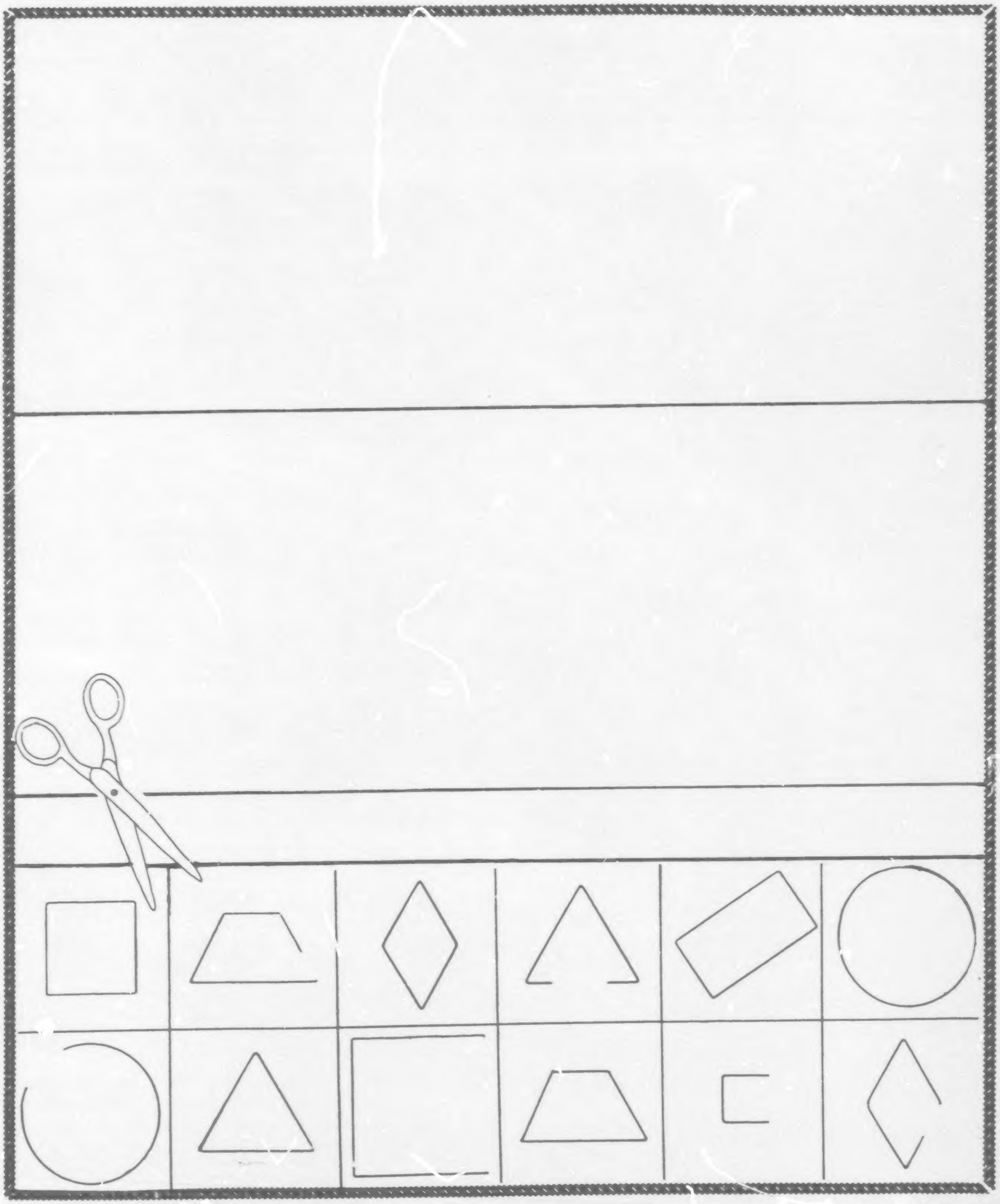
Repeat using other sets of curves. Ask the students to draw examples of each.

STRATEGY 2: Prepare and distribute a large rubber band to each student. Hold the rubber band like this . Say, "This is a simple closed curve." Form with the rubber band. Say, "This is a complex closed curve. How are they different?" (a complex closed curve crosses itself) Ask the students to form simple and complex closed curves with their rubber bands and draw the different curves.

P.O. 3.09.02.01

NAME:______________________________ CLASS:________ DATE:______

Cut and paste each shape in the correct space.

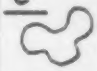


P.O. 3.09.02.02

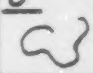
NAME: ______________________ CLASS: ________ DATE: ________

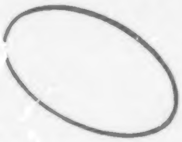
Write C if the curve is closed.
Write O is the curve is open.

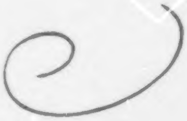
Write "C" if the circle is closed.

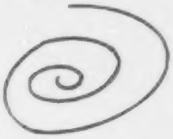
c


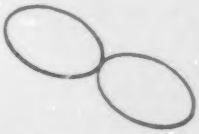
Write "O" if the circle is open.

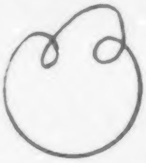
o


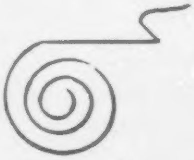
1 ____


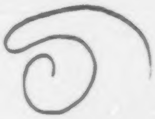
2 ____


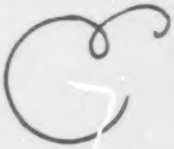
3 ____


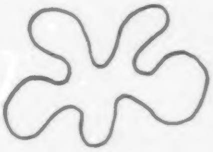
4 ____


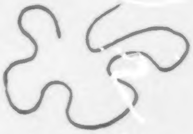
5 ____


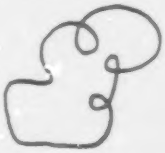
6 ____


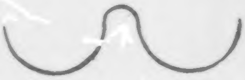
7 ____


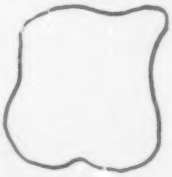
8 ____


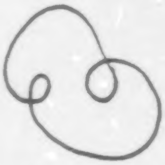
9 ____


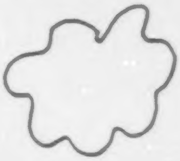
10 ____


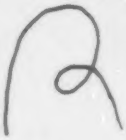
11 ____


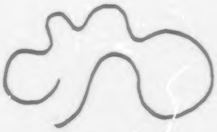
12 ____


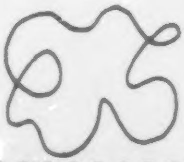
13 ____


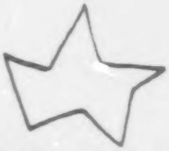
14 ____


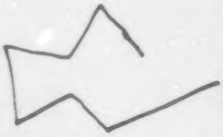
15 ____


16 ____


17 ____


18 ____


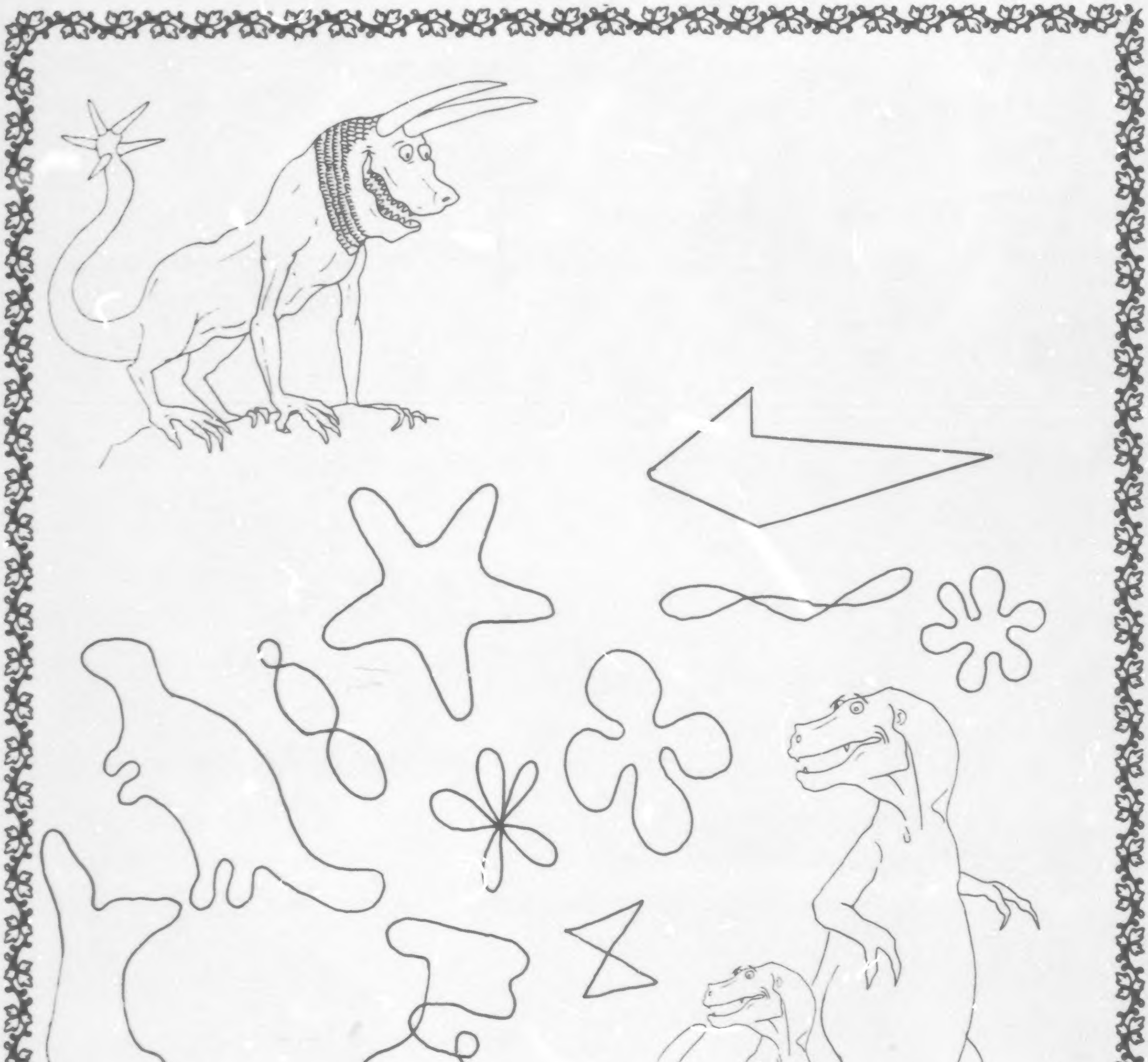
19 ____


20 ____


P.O. 3.09.02.03

NAME: ______________________________ CLASS: __________ DATE: ________

Color the simple closed curves.



3.13.02 LOCATE INFORMATION

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.13.02.01A locate pertinent information within a chart/table to solve problems;
e.g.,

Sandwiches		Drinks	
Ham	$1.80	Juice	$.75
Salami	$1.60	Soda	$.55
Cheese	$1.45	Milk	$.50

I bought a drink and a sandwich and paid $2.20. Which drink did I buy?

3.13.02.02A locate pertinent information within a paragraph to solve problems.
e.g.,

Judy and Sara went to the zoo for the day. They traveled 5 miles by bus and walked 4 blocks. At the zoo they saw many interesting animals: 3 tigers, 3 lions, 4 ducks, and an elephant. They each bought lunch for $1.15.

How many 4 legged animals did they see?

How much money did the girls spend together?

3.13.02

VOCABULARY

TERMS

information
pertinent (necessary)
locate

GETTING STARTED

Write a word problem on the chalkboard. Include within the problem extraneous information which is not needed to solve the problem. Ask a student to read the problem aloud and decide what the problem is asking. Say, "Some of the information appearing in the problem is not needed to solve it." Ask a student to read the first sentence of the problem. Say, "Is the information presented in this sentence necessary? We will cross out any sentence containing unnecessary information." Ask a student to read the shorter version of the problem and determine if the remaining information is pertinent. Repeat this procedure using other examples of word problems containing extraneous information.

Draw a table showing a bus schedule on the chalkboard. The headings of the schedule should include the following.

Bus #	Color of Bus	Time Leaving Station	# of People on the bus	Color of Seats on the Bus	Time Arriving at Destination
3	Blue	12:00 P.M.	46	gray	1:30 P.M.

Fill in the table with the appropriate information. Say, "You are leaving to go somewhere on Bus #3. What information about Bus #3 will you need to know?" Circle on the schedule the student responses which are pertinent to the problem. Ask why the uncircled information is not needed. Continue using this table to locate information pertinent to solving a given problem.

3.13.02

3.13.02.01 **locate pertinent information within a chart/table to solve problems**

STRATEGY 1: Write the following chart on the chalkboard.

e.g.,

Apples	40¢	Watermelon	30¢
Pears	50¢	Cantalope	90¢
Bananas	20¢	Plums	60¢

Say, "I went to the store and bought three different kinds of fruit. I paid $.90 for the fruit. What were the three kinds of fruit I bought?" Ask the students to analyze the data and mix and match the different fruits. Write the different combinations on the chalkboard. Say, "Decide which of the combinations answer the problem." Write the number sentence on the chalkboard.

e.g.,

40¢ + 20¢ + 30¢ = 90¢

Solution - The fruits purchased were apples, bananas and watermelon.

Repeat this procedure using other examples.

STRATEGY 2: Draw the following chart on the chalkboard.

Stickers

Scratch and Sniff	$.20	Large Felties	$.90
Googly Eyes	.70	Small Felties	.45
Puffies	.50	Day Glo	.35
Super Heroes	.15	Stars	.05

Say, "Mary bought 3 stickers in the Sticker Store. She spent $1.00. Which stickers did she buy?"

Ask the students to look at the chart and discuss different methods of finding the answer.

Ask several students to come to the chalkboard and write a number sentence that would solve the problem.

e.g.,

50¢ + 15¢ + 35¢ = $1.00

3.13.02

STRATEGY 2: cont'd

One possible solution - Mary bought Puffies, Super Heroes, and Day Glo stickers. Mary also could have bought Small Felties, Day Glo and Scratch and Sniff.

Continue this procedure using the chart.

3.13.02.02 locate pertinent information within a paragraph to solve problems

STRATEGY 1: Write the following problem on the chalkboard.

> Jack and Jill went downtown by train at 9:00 A.M. They traveled 10 miles on the train and walked 3 blocks. They saw two movies. The price of the first movie was $2.00 per person and it was 1 hour long. The price of the second movie was $3.00 per person and it was 2 hours long. They spent $2.15 each for lunch. They ate for $\frac{1}{2}$ hour. They traveled back for 1 hour.

Prepare a set of index cards with one question written on each, e.g., How much time did Jack and Jill spend at the movies?

Say, "Read the problem and decide which information is really needed. The question being asked is the key to finding the information and answering the problem." Ask individual students to read the questions and read the necessary sentences.

STRATEGY 2: Write a word problem on the chalkboard.

> Judy and Sarah went to the zoo for the day. They traveled 5 miles by bus and walked 4 blocks. At the zoo they saw many interesting animals. They saw 3 tigers, 3 lions, 4 ducks and an elephant. They each bought lunch for $1.15. How many 4-legged animals did they see? How much money did the girls spend together?

Ask the students to locate and read the sentences in the problem which help to give the answers.

P.O. 3.13.02.01

NAME: ______________________ CLASS: ________ DATE: ________

Locate information and solve each problem using the chart.

SANDWICHES		DRINKS	
Ham	$1.75	Juice	$ .80
Bologna	1.50	Tea	.50
Tuna Fish	1.95	Milk	.40
Cheese	1.30	Soda	.60
Egg Salad	1.45	Ice Cream Soda	1.25

John bought a sandwich and a drink. John paid $3.00 for both. What kind of sandwich did John buy?

Answer ______________

Mary bought a drink and a sandwich. She paid $2.45 for both. Which drink did she buy? __________ Which sandwich did she buy? __________

I have $1.85 to spend. Which drink and which sandwich can I buy totaling $1.85?

Answer ______________

P.O. 3.13.02.02

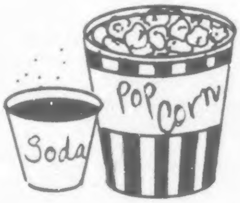
NAME:______________________________ CLASS:________ DATE:________

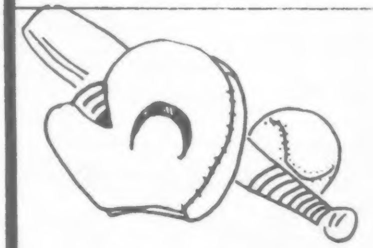
Read each problem and question carefully. Then choose the important information to help you solve the problem.

In a galaxy far, far away

WORK HERE

Mary and Jane went to the movies. The movie theatre is very small. There are only nine rows of seats with five seats in each row. The price of the ticket is $1.50. Each girl bought popcorn for $.75 and a drink for $.50.
How much did each girl spend?
How many seats are there in the movie house?





John and his father went to the baseball game. The first team scored 5 homeruns in the first part of the game. The second team scored 4 runs in the first part of the game. In the second part of the game the first team scored only one run, while the second team scored another 2 runs. John and his father ate 2 frankfurters each. The frankfurters cost $.90.
How much did the frankfurters cost in all?
How many home runs did each team make in the game?
Which team won the game?

3.06.03 ADDITION AND SUBTRACTION OF FRACTIONS (LIKE DENOMINATORS)

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.06.03.01B add fractions having like denominators in vertical and horizontal formats;

e.g.,

$$\begin{array}{r} \frac{5}{8} \\ +\ \frac{2}{8} \\ \hline \frac{7}{8} \end{array} \qquad \frac{5}{8} + \frac{2}{8} = \frac{7}{8}$$

3.06.03.02B subtract fractions having like denominators in horizontal and vertical formats;

e.g.,

$$\begin{array}{r} \frac{8}{10} \\ -\frac{3}{10} \\ \hline \frac{5}{10} \end{array} \qquad \frac{8}{10} - \frac{3}{10} = \frac{5}{10}$$

3.06.03.03B solve story problems related to skills learned in this module.

e.g.,

Trina grew $\frac{4}{9}$ of an inch in May. During the month of June, she grew $\frac{3}{9}$ of an inch. How much did Trina grow altogether?

$\frac{4}{9} + \frac{3}{9} = \frac{7}{9}$ of an inch

3.06.03

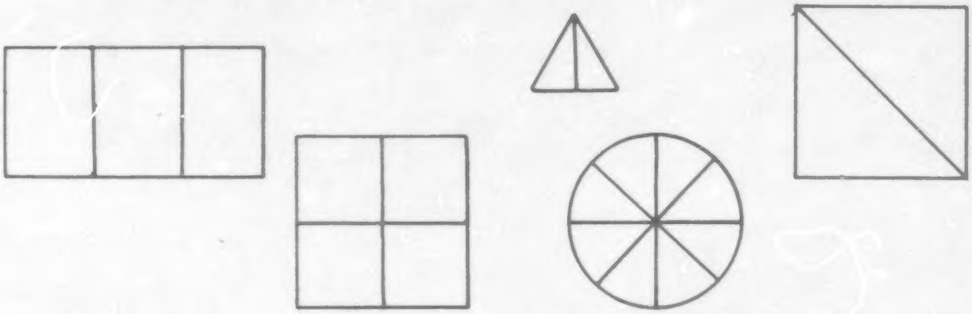
VOCABULARY

TERMS

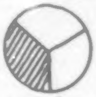
like fractions
unlike fractions
proper
numerator
denominator

GETTING STARTED

Draw figures on the chalkboard which are divided into a set number of equal parts, e.g., fourths.



Say, "How many equal parts do you see in this figure? What is each part called?" Point to a fractional part and say, "What part is this?" Ask a student to label the part. Repeat this procedure for the remaining figures.

Draw a circle on the chalkboard, e.g.,  . Say, "How many equal parts does this figure have? What is each part called? What part is shaded?" Ask a student to label the shaded portion. While pointing to the numerator, say, "What is the top number called? What does it tell us?" Repeat this procedure for the denominator.

Write several fractions on the chalkboard, e.g [illegible], $\frac{1}{8}$. Ask the students to identify the denominator or the numerator. Elicit the definitions of a numerator and a denominator. Label each part of each fraction.

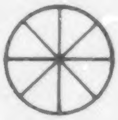
e.g., $\frac{1}{6}\begin{array}{l}\longrightarrow \text{numerator}\\ \longrightarrow \text{denominator}\end{array}$

3.06.03

3.06.03.01 **add fractions having like denominators in horizontal and vertical formats**

STRATEGY 1: Draw the following sketch on the chalkboard.

e.g.,



Say, "How many equal parts is this figure divided into? (8) What is each part called?" ($\frac{1}{8}$)

Ask a student to shade in $\frac{5}{8}$. Say, "How many eighths did you shade in?" (5) Write $\frac{5}{8}$ on the chalkboard. Ask another student to shade in $\frac{2}{8}$. Say, "How many eighths did you shade in?" (2) Write $\frac{2}{8}$ under the $\frac{5}{8}$.

e.g.,

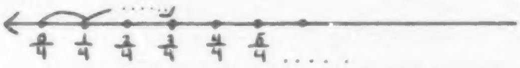
$$\begin{array}{r} \frac{5}{8} \\ +\ \frac{2}{8} \\ \hline \end{array}$$

Say, "How many eighths are shaded in all?" Write $\frac{5}{8} + \frac{2}{8} = \frac{8}{8}$ on the chalkboard. Say, "When adding like fractions, we keep the denominators the same and add the numerators."

Repeat this procedure using other like fractions.

STRATEGY 2: Draw a number line on the chalkboard.

e.g.,



Say, "This is a fractional number line. It works the same way as a regular number line." Point to $\frac{1}{4}$. Mark $\frac{1}{4}$ on the number line. Say, "$\frac{1}{4}$ is where I will start. I want to move $\frac{2}{4}$ more. Where will I land?" Write and say, "$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$."

Repeat this procedure.

3.06.03.02 **subtract fractions having like denominators in vertical and horizontal formats**

STRATEGY 1: Divide the students into groups of 3 or 4. Prepare and distribute to each group a set of colored interlocking cubes. Attach five cubes. Say, "This is one whole. How many equal parts does it have? (5) What is each part called? ($\frac{1}{5}$) How many fifths in all?" ($\frac{5}{5}$) Write $\frac{5}{5}$ on the chalkboard. Say, "I want to take away $\frac{2}{5}$." Write $\frac{5}{5} - \frac{2}{5}$ on the chalkboard. Say, "How many fifths are left? ($\frac{3}{5}$) When subtracting like fractions, the denominator remains the same and we subtract the numerators." Repeat this procedure using the following examples.

e.g., $\frac{6}{8} - \frac{3}{8}$, $\frac{4}{9} - \frac{1}{9}$, $\frac{2}{3} - \frac{1}{3}$

STRATEGY 2: Adapt Strategy #2 used in P.O. 3.06.03.01 for subtraction.

3.06.03.03 **solve story problems related to skills learned in this module**

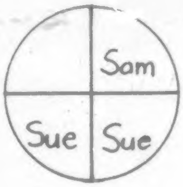
STRATEGY 1: Write a problem on the chalkboard.

e.g.,

Sam ate $\frac{1}{4}$ of a pizza. Sue ate $\frac{2}{4}$. How much of the pizza was eaten?

Ask the students to go through the problem using problem solving procedures. Select a student to come to the chalkboard and draw a diagram to illustrate the problem.

e.g.,



STRATEGY 1: cont'd Ask another student to write a number sentence and solve the problem.

e.g., $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

STRATEGY 2: Prepare a set of cards with one problem involving addition and subtraction of like fractions written on each card. Use the students' names in the problems. Distribute the card with his/her name to each student to solve. Ask the students to exchange the cards with a neighbor.

e.g.,

John had $\frac{5}{8}$ of a box of candy. He ate $\frac{1}{8}$ of the candy. What part of the candy was left?

$\frac{5}{8} - \frac{1}{8} = \frac{4}{8}$

P.O. 3.06.03.01

NAME: ______________________ CLASS: __________ DATE: ________

Find each sum.

When adding fractions with like denominators, add the numerators. Then write the sum over the denominator.

$$\begin{array}{r} \frac{2}{4} \\ + \frac{1}{4} \\ \hline \frac{3}{4} \end{array}$$

Find each sum.

$\begin{array}{r} \frac{1}{8} \\ + \frac{3}{8} \\ \hline \end{array}$	$\begin{array}{r} \frac{2}{9} \\ + \frac{3}{9} \\ \hline \end{array}$	$\begin{array}{r} \frac{2}{7} \\ + \frac{3}{7} \\ \hline \end{array}$	$\begin{array}{r} \frac{1}{10} \\ + \frac{5}{10} \\ \hline \end{array}$	$\begin{array}{r} \frac{1}{5} \\ + \frac{1}{5} \\ \hline \end{array}$
$\begin{array}{r} \frac{4}{6} \\ + \frac{1}{6} \\ \hline \end{array}$	$\begin{array}{r} \frac{2}{5} \\ + \frac{2}{5} \\ \hline \end{array}$	$\begin{array}{r} \frac{2}{9} \\ + \frac{4}{9} \\ \hline \end{array}$	$\begin{array}{r} \frac{2}{3} \\ + \frac{1}{3} \\ \hline \end{array}$	$\begin{array}{r} \frac{3}{4} \\ + \frac{1}{4} \\ \hline \end{array}$

$\frac{9}{10} + \frac{1}{10} = \square$	$\frac{6}{12} + \frac{2}{12} = \square$	$\frac{9}{16} + \frac{3}{16} = \square$
$\frac{2}{5} + \frac{4}{5} = \square$	$\frac{1}{9} + \frac{5}{9} = \square$	$\frac{1}{8} + \frac{2}{8} = \square$

P.O. 3.06.03.02

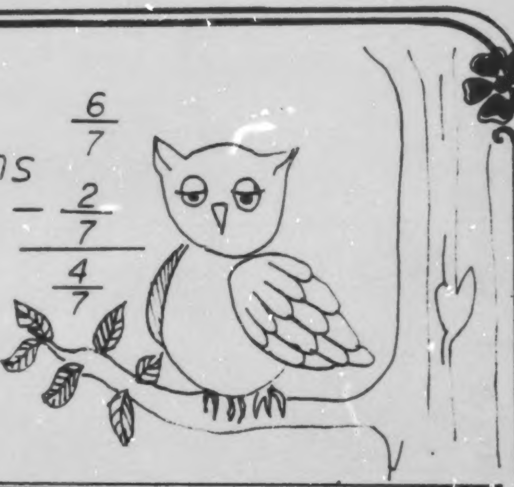
NAME: ____________________ CLASS: ________ DATE: ________

Find each difference.

BE WISE!

When subtracting fractions with like denominator's, subtract the numerator s. Write the difference over the denominator.

$$\begin{array}{r} \frac{6}{7} \\ -\frac{2}{7} \\ \hline \frac{4}{7} \end{array}$$



$\begin{array}{r} \frac{7}{8} \\ -\frac{2}{8} \\ \hline \end{array}$	$\begin{array}{r} \frac{5}{6} \\ -\frac{2}{6} \\ \hline \end{array}$	$\begin{array}{r} \frac{6}{12} \\ -\frac{4}{12} \\ \hline \end{array}$	$\begin{array}{r} \frac{5}{8} \\ -\frac{3}{8} \\ \hline \end{array}$
$\begin{array}{r} \frac{8}{9} \\ -\frac{8}{9} \\ \hline \end{array}$	$\begin{array}{r} \frac{12}{6} \\ -\frac{3}{6} \\ \hline \end{array}$	$\begin{array}{r} \frac{9}{10} \\ -\frac{3}{10} \\ \hline \end{array}$	$\begin{array}{r} \frac{8}{9} \\ -\frac{5}{9} \\ \hline \end{array}$

$\frac{8}{7} - \frac{3}{7} = \boxed{}$	$\frac{6}{4} - \frac{3}{4} = \boxed{}$	$\frac{1}{2} - \frac{1}{2} = \boxed{}$
$\frac{9}{10} - \frac{4}{10} = \boxed{}$	$\frac{2}{2} - \frac{1}{2} = \boxed{}$	$\frac{11}{12} - \frac{4}{12} = \boxed{}$

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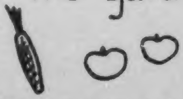
P.O. 3.06.03.03

NAME: ______________________ CLASS: ________ DATE: ______

Read and solve each problem.
Show your work.

Recipe: fruit bars - $\frac{3}{4}$ cup of flour oatmeal cookies - $\frac{1}{4}$ cup of flour How much more flour is needed for the fruit bars?	Work Space
Jack and Jill walked $\frac{2}{10}$ mile up the hill and $\frac{4}{10}$ mile down the hill. How much did they walk in all?	
If Lee ate $\frac{2}{4}$ of an apple, how many fourths are left? (Clue: How many fourths in a whole?)	
Ron grew $\frac{2}{8}$ of an inch in January and $\frac{4}{8}$ of an inch in February. How much did he grow altogether?	
There was $\frac{3}{4}$ of a tank of gas when the Smith family left. When they returned there was $\frac{1}{4}$ of a tank left. How many fourths did they use on their trip?	
Jim planted $\frac{2}{7}$ of the garden with corn. He planted $\frac{3}{7}$ with tomatoes. How much of the garden did Jim use? 	

3.04.06 MULTIPLICATION OF SIXES AND SEVENS

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.06.01B multiply six (6) by the numbers one (1) through nine (9) using vertical and horizontal formats;

e.g.,

$\begin{array}{r} 6 \\ \times\ 1 \\ \hline 6 \end{array}$ $\begin{array}{r} 6 \\ \times\ 2 \\ \hline 12 \end{array}$ $\begin{array}{r} 6 \\ \times\ 3 \\ \hline 18 \end{array}$

$1 \times 6 = 6$
$2 \times 6 = 12$
$3 \times 6 = 18$

3.04.06.02B multiply seven (7) by the numbers one (1) through nine (9) using vertical and horizontal formats;

e.g.,

$\begin{array}{r} 7 \\ \times\ 1 \\ \hline 7 \end{array}$ $\begin{array}{r} 7 \\ \times\ 2 \\ \hline 14 \end{array}$ $\begin{array}{r} 7 \\ \times\ 3 \\ \hline 21 \end{array}$

$1 \times 7 = 7$
$2 \times 7 = 14$
$3 \times 7 = 21$

3.04.06.03B apply the commutative property of multiplication to the six (6) and seven (7) times table;

e.g.,

$6 \times 7 = 42$
$7 \times 6 = 42$
$6 \times 7 = 7 \times 6$

3.04.06.04B solve word problems related to skills learned in this module.

e.g.,

A room has 7 rows of desks with 6 desks in each row. How many desks are there in the room?

$7 \times 6 = 42$ desks

3.04.06

VOCABULARY

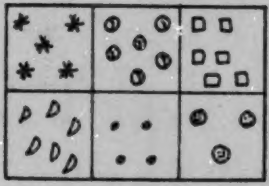
TERMS

multiplication

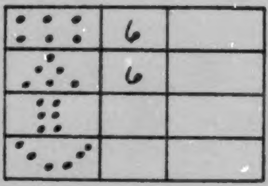
GETTING STARTED

Draw the following charts on the chalkboard.

I



II

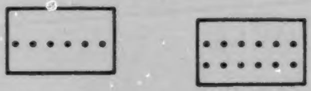


Ask a student to circle one group in chart I that contains six objects. Continue this procedure until all the sets of six have been circled. Ask the students to look at chart II. Say, "How many dots are there in the first box." (6) Write the number six next to the first representation. Say, "How many dots are in the second box?" Write the number next to the second representation. Say, "How many dots are there in the first and second boxes?" Write the number sentence, 6 + 6 = 12.

Repeat this procedure with groups of six through nine sixes.

Prepare and distribute to every student index cards with different multiples of six, shown in dots, on each card.

e.g.,



Say, "Circle the groups of six on your card. You must use all of the dots." Ask those students who only circled one group to hold up their cards. Say, "How many dots did you circle? (6) Write a number sentence that tells about this picture. (1 x 6) Hold up your cards if you circled two groups. How many dots did you circle in all?" (12) Write a number sentence that tells about this arrangement, e.g., (2 x 6). Write the number sentence on the chalkboard. Continue this procedure until all cards have been used.

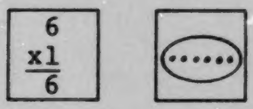
3.04.06

3.04.06.01 **multiply six (6) by the numbers one (1) through nine (9) using vertical and horizontal formats**

STRATEGY 1: Prepare a flannel board and 10 cutouts of ladybugs with six dots on the back. Display the first ladybug. Say, "How many ladybugs do you see? (1) How many spots does the ladybug have on its back? (6) There is 1 ladybug with 6 spots." Write 1 x 6 = 6 on the chalkboard. Place 2 ladybugs on the flannel board. Say, "How many ladybugs do you see? (2) How many spots does each ladybug have? (6) How many spots are there altogether? (12) There are 2 ladybugs with 6 spots each and there are 12 spots in all." Write 2 x 6 = 12 on the chalkboard. Repeat this procedure using ladybugs through 9 sixes.

STRATEGY 2: Prepare two sets of index cards, one set with the basic multiplication facts for the six times table, the other set with pictorial representations in groups of six.

e.g.,



Display the picture cards face up. Hold up the card with the example 1 x 6 on it. Say, "Look for the card that shows one group of six objects and place the two cards together."

Repeat this procedure with the other multiples of six through 9 sixes.

3.04.06.02 **to multiply seven by the numbers one (1) through nine (9) using vertical and horizontal formats**

3.04.06

STRATEGY 1: Say, "How many days are there in one week?" Write 1 week = 7 days on the chalkboard. Draw a chart on the chalkboard.

e.g.,

Weeks	1	2	3	4	5	6
Days	7	14				

Ask the students to complete the chart in their notebooks. Write multiplication sentences to describe the relationship between days and weeks, e.g., 7 x 1 = 7, 7 x 2 = 14.

STRATEGY 2: Prepare a chart through 6 sevens on the chalkboard.

7	1 x 7 = ___
7 + 7	2 x 7 = ___
7 + 7 + 7	3 x 7 = ___
7 + 7 + 7 + 7	4 x 7 = ___

Ask a student to draw a line from each addition sentence to the corresponding multiplication sentence. Say, "The number of times you see the seven is the first factor in the multiplication sentence. The second factor will always be 7, e.g., 7 + 7 + 7 = 3 x 7." Ask the students to complete the chart through 9 sevens.

3.04.06.03 **apply the commutative property of multiplication to the six (6) and seven (7) times table**

STRATEGY 1: Prepare magnetic circles to use on the chalkboard and display the following array.

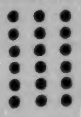
e.g.,
OOOOOO
OOOOOO
OOOOOO

Say, "How many rows of circles do we have? (3) How many circles are there in each row? (6) How many circles do we have in all?" (18) Write 3 x 6 = 18 on the chalkboard. Say, "Instead of counting each circle we can multiply the number of rows by the

STRATEGY 1: **cont'd**

number of circles in each row to find the answer. We place a multiplication symbol between the three and the six and an equal sign between the six and the eighteen to complete the number sentence." Display the following.

e.g.,

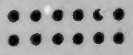


Repeat the above procedure. Say, "What multiplication example can we write for this array?" Elicit from the students that this array is represented by 6 x 3 = 18. Say, "What is the same about the two examples? What is different? Changing the order of the factors does not change the answer." Repeat this procedure with other arrays using the facts for six and seven.

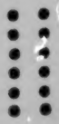
STRATEGY 2:

Prepare and distribute 30 popsicle sticks to groups of students. Say, "Make two rows of sticks with 6 sticks in each row." Draw the representation on the chalkboard. Ask the students to write the number sentence that matches the array, e.g., 2 X 6 = 12. Write each sentence under the appropriate array.

e.g.,



2 x 6



6 x 2

Say, "Look at these two sentences. The numbers are the same, the answers are the same, but something is different. Can you tell us what it is? The order of the numbers is different. In a multiplication sentence the order of the numbers does not change the product." Repeat this procedure using other arrays for facts of six and seven.

3.04.06

3.04.06.04 solve word problems related to skills learned in this module

STRATEGY 1: Write the following word problem on the chalkboard.

> John went to the store. He bought three packages of pencils. Each package contains 6 pencils. How many pencils did John buy?

Ask a student to read the problem. Say, "What key words tell us the operation to use to solve the problem? What number sentence can we write for this problem?" Write 3 x 6 = __ on the chalkboard. Ask the students to estimate an answer, complete the number sentence, and label the answer.

Repeat this procedure with other word problems containing multiples of six and seven.

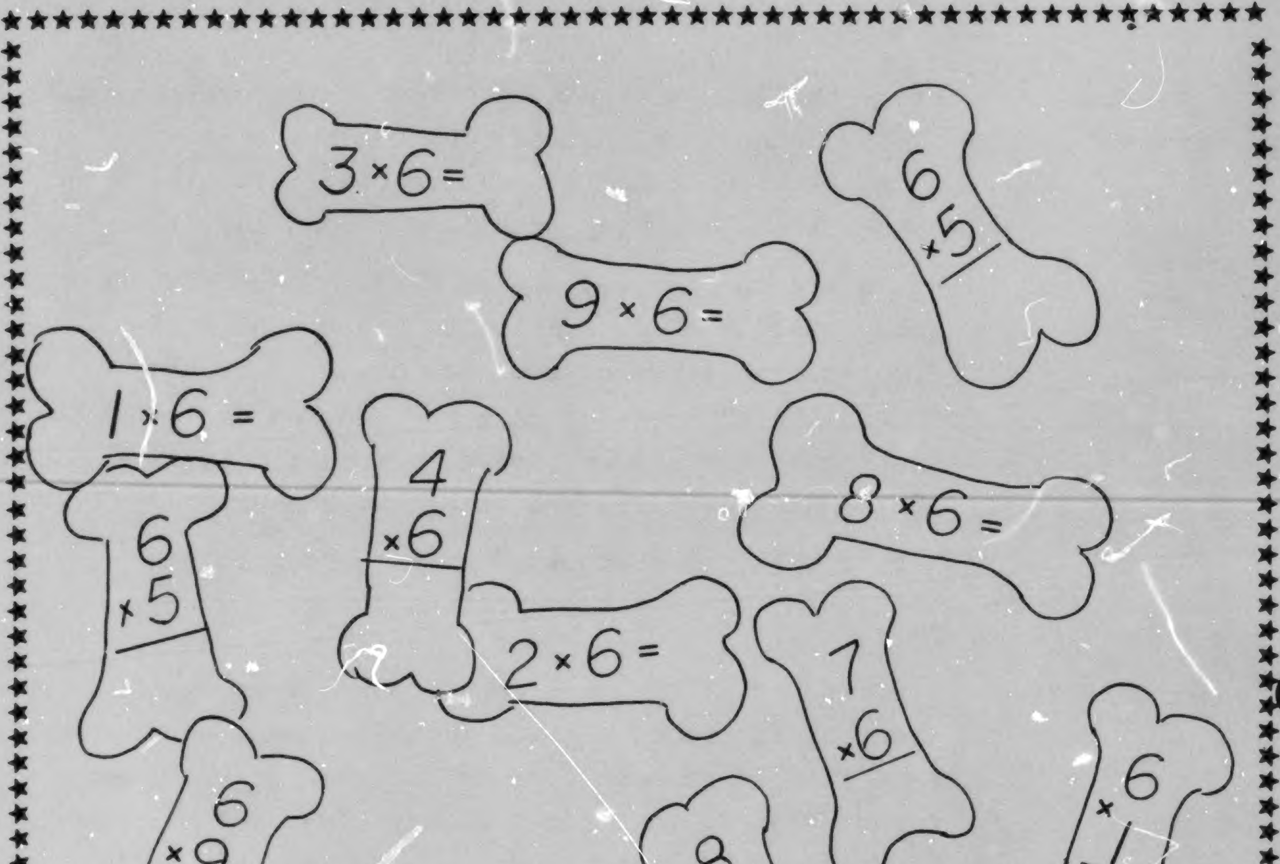
STRATEGY 2: Prepare and display a group of nine items at the front of the room, e.g., a pencil, a pen, a pad.... Each item is to have a price tag with a specified amount from 1¢ to 9¢ on it. Say, "Mr. and Mrs. MacMulty have six children. Everytime they go shopping, they must buy six of the same item." Ask a student to come to the front of the room, pretend to be Mr. or Mrs. MacMulty and choose an item to buy. Then write a number sentence corresponding to the purchase. Ask another student to complete the number sentence.

Repeat this procedure for facts of seven.

P.O. 3.04.06.01

NAME: ______________________ CLASS: ________ DATE: _______

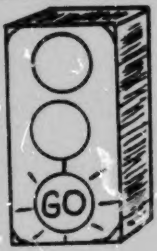
Help Multidog gather his bones.
Find the product for each example.


3 × 6 =
6
× 5
9 × 6 =
1 × 6 =
4
× 6
8 × 6 =
6
× 5
2 × 6 =
7
× 6
6
× 9
6
× 1
8
× 6
3 × 6 =
6 × 6 =
6
× 2
6
× 4
6 × 5 =
1 × 6 =

P.O. 3.04.06.02

NAME: ______________________ **CLASS:** __________ **DATE:** ________

Complete each multiplication sentence.



2 x 7 =

10 x 7 =

5 x 7 =

3 x 7 =

7 x 7 =

8 x 7 =

1 x 7 =

9 x 7 =

4 x 7 =

6 x 7 =

7 x 4	7 x 1	7 x 6	7 x 10

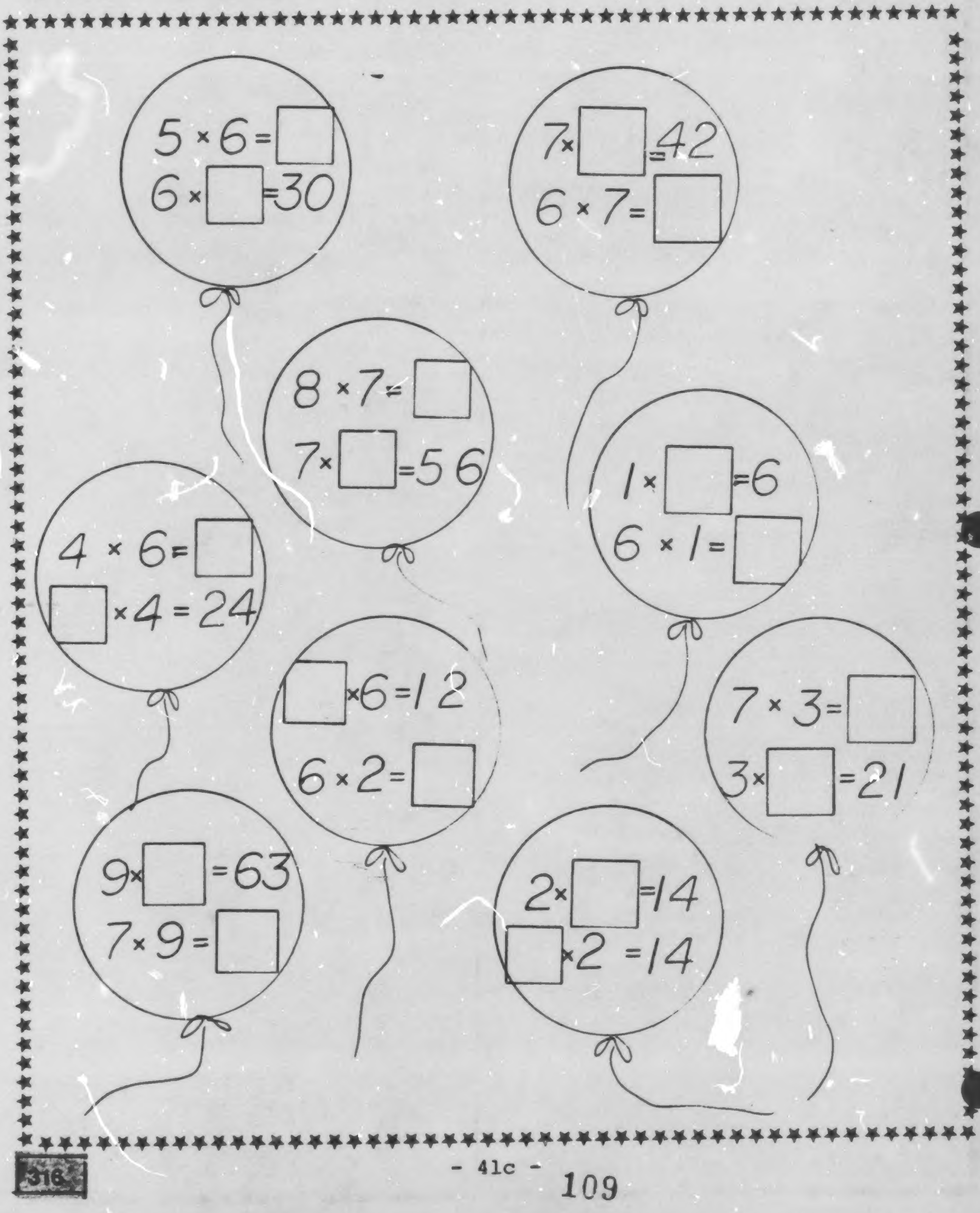
7 x 8	7 x 3	7 x 9

7 x 7	7 x 2	7 x 5

P.O. 3.04.06.03

NAME: ______________________ CLASS: __________ DATE: ________

Catch the balloons by filling in the boxes.



$5 \times 6 = \square$

$6 \times \square = 30$

$7 \times \square = 42$

$6 \times 7 = \square$

$8 \times 7 = \square$

$7 \times \square = 56$

$1 \times \square = 6$

$6 \times 1 = \square$

$4 \times 6 = \square$

$\square \times 4 = 24$

$\square \times 6 = 12$

$6 \times 2 = \square$

$7 \times 3 = \square$

$3 \times \square = 21$

$9 \times \square = 63$

$7 \times 9 = \square$

$2 \times \square = 14$

$\square \times 2 = 14$

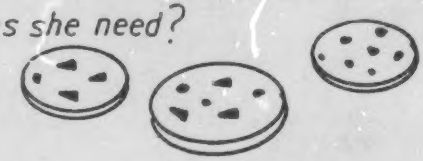
P.O. 3.04.06.04

NAME:____________________________________CLASS:__________DATE:________

Solve each problem.

Solve each problem.

1. Mary had 7 plates. She wants to serve 6 cookies on each plate. How many cookies does she need?



2. Carlos saves baseball cards. 5 cards come in one pack. Carlos bought 6 packs. How many baseball cards did he get?

3. Wanda has 3 dolls. She made 6 dresses for each doll. How many dresses did she make?

4. There are 2 birds in each cage. There are 7 cages. How many birds in all?

3.05.04 DIVISION OF WHOLE NUMBERS (SIXES THROUGH FIFTY-FOUR, SEVENS THROUGH SIXTY-THREE)

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.04.01B divide by 6, using dividends to 54, without a remainder;
e.g.,

$12 \div 6 = 2 \qquad \begin{array}{r} 2 \\ 6\overline{)12} \end{array} \qquad \frac{12}{6}$

$18 \div 6 = 3 \qquad \begin{array}{r} 3 \\ 6\overline{)18} \end{array} \qquad \frac{18}{6}$

$36 \div 6 = 6 \qquad \begin{array}{r} 6 \\ 6\overline{)36} \end{array} \qquad \frac{36}{6}$

$42 \div 6 = 7 \qquad \begin{array}{r} 7 \\ 6\overline{)42} \end{array} \qquad \frac{42}{6}$

3.05.04.02B divide by 7, using dividends to 63, without a remainder.
e.g.,

$63 \div 7 = 9 \qquad \begin{array}{r} 9 \\ 7\overline{)63} \end{array} \qquad \frac{63}{7}$

$49 \div 7 = 7 \qquad \begin{array}{r} 7 \\ 7\overline{)49} \end{array} \qquad \frac{49}{7}$

$35 \div 7 = 5 \qquad \begin{array}{r} 5 \\ 7\overline{)35} \end{array} \qquad \frac{35}{7}$

3.05.04

VOCABULARY

TERMS	SYMBOLS
dividend	
divisor	
quotient	
divided by	÷, $\overline{)\quad}$, —

GETTING STARTED

Play "Division Bee." Divide the class into two teams. Prepare flashcards with division facts for 2,3,4,5, e.g., 9 ÷ 3, 16 ÷ 4. Hold up a flashcard for the first student on the first team. If he/she gives the correct answer, his/her team gets a point. If an incorrect answer is given, the other team gets a chance for the point. Continue by alternating the teams. The team with the most points wins.

Using oak tag, make Bingo type boards.

e.g.,

B	I	N	G	O

In each box write the numbers 0 through 9 randomly. Numbers may be repeated. Hold up a flashcard and say, "If you have the answer to this example, cover it. You may only cover one number for each example. When 5 boxes are covered horizontally, vertically, or diagonally call out Bingo." Repeat this procedure several times.

3.05.04

3.05.04.01 **divide by 6, using dividends to 54, without a remainder**

STRATEGY 1: Prepare a magnetic board and discs. Place 12 discs on the board. Say, "Each one of these discs represents a chocolate chip cookie. Kenya has 12 chocolate chip cookies. She wants to share them with 5 of her friends. Don't forget to count Kenya. How many cookies will each one get?" Ask one student to come to the magnetic board and distribute the discs so that they are in 6 equal groups. Elicit from the students that 12 divided by 6 equals 2. Write $12 \div 6 = 2$, $\frac{12}{6} = 2$ and $\begin{array}{r} 2 \\ 6\overline{)12} \end{array}$ on the chalkboard. Repeat this procedure, adding additional discs, until all the division facts for 6 have been derived. Say, "There are three different ways of writing division examples: $12 \div 6 = 2$, $\frac{12}{6} = 2$ and $\begin{array}{r} 2 \\ 6\overline{)12} \end{array}$, and each is read 12 divided by 6 equals 2."

STRATEGY 2: Cut pieces of string into the following lengths: 6cm, 12cm, 24cm, 30cm, 36cm, 42cm and 54cm. Take one of the lengths of string and ask a student to measure the length. Say, "How many 6cm pieces can you get from the string?" Using a cm ruler and a pair of scissors, ask the student to cut the string into 6cm pieces. As each piece is cut, write the division sentence for that length on the chalkboard, e.g., 24cm ÷ 6cm = 4cm. Say, "There are 3 ways of writing a division example, e.g., $24 \div 6 = 4$, $\begin{array}{r} 4 \\ 6\overline{)24} \end{array}$ and $\frac{24}{6} = 4$."

Repeat this procedure for each length of string.

3.05.04

3.05.04.02 divide by 7, using dividends to 63, without a remainder

STRATEGY 1: Prepare and use a calendar where the first of the month begins on a Sunday. Say, "There are seven days in one week." Point to the calendar and say, "If we have 28 days in this month and there are 7 days in one week, how many weeks will there be? Looking at the calendar you can see that 28 days equals 4 weeks." Write on the chalkboard $\begin{array}{r}4\\7\overline{)28}\end{array}$. Repeat this procedure for 21, 14 and 7. Say, "If we double 21 days, how many days will we have? (42) If $\begin{array}{r}3\\7\overline{)21}\end{array}$ then $\begin{array}{r}6\\7\overline{)42}\end{array}$." Repeat this procedure, doubling 28 to get the division fact for 56. Say, "Division examples can be written in 3 different ways." Show the ways on the chalkboard.

e.g.,

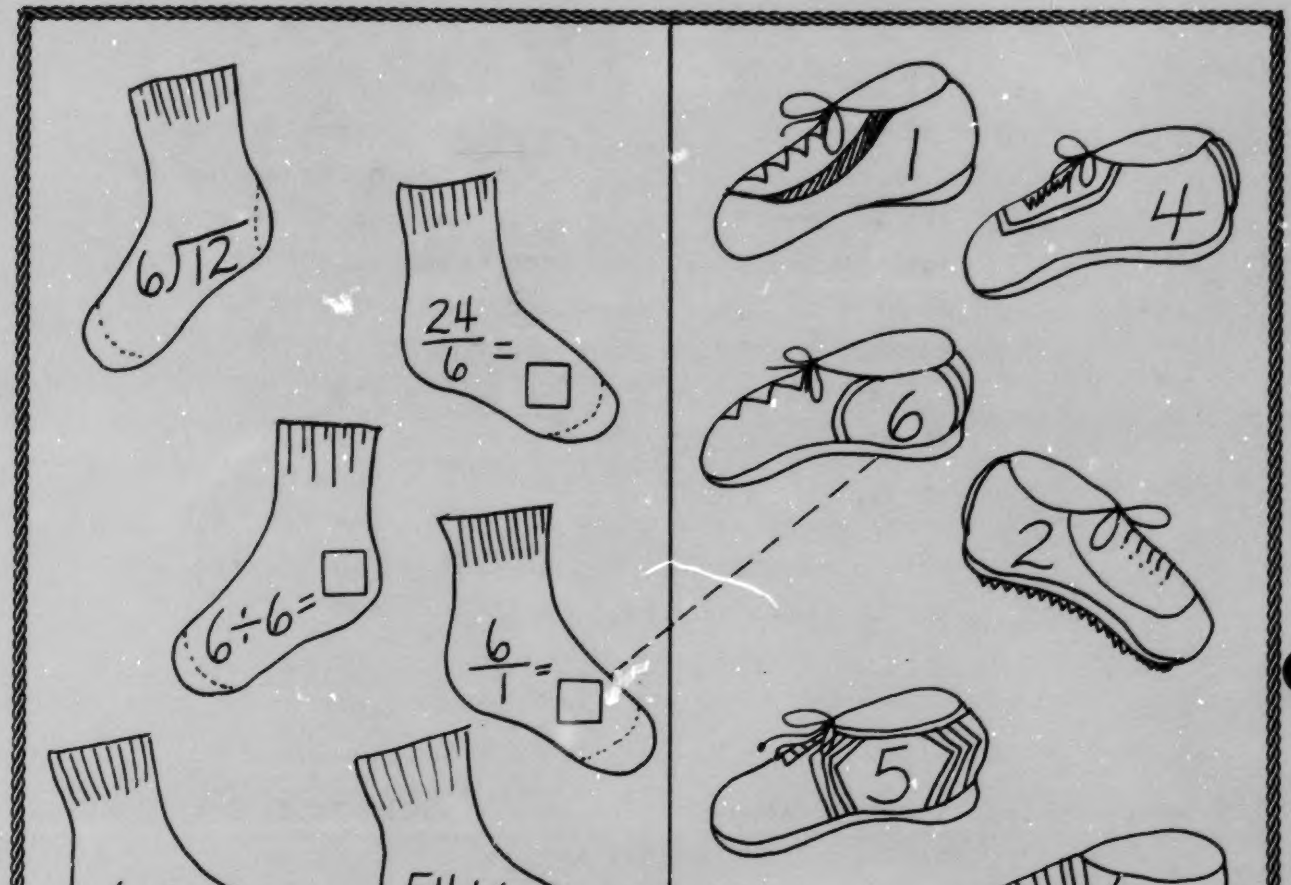
$$7 \div 7 = 1,\ \frac{7}{7} = 1 \text{ and } \begin{array}{r}1\\7\overline{)7}\end{array}$$

STRATEGY 2: Adapt Strategy 2 used in P.O. 3.05.04.01 for division by 6 and 7.

P.O. 3.05.04.01

NAME: ____________________ CLASS: ________ DATE: ________

Find the shoe for each sock.


6)12
24/6 = □
6÷6=□
6/1 = □
6)30
54÷6=□
18÷6=□
6)48
42/6 =□
1
4
6
2
5
7
3
8
4

P.O. 3.05.04.02

NAME: ______________________ **CLASS:** __________ **DATE:** __________

Find the quotient for each example.

$63 \div 7 = \square$

$\begin{array}{r} \square \\ 7\overline{)49} \end{array}$

$\frac{7}{7} = \square$

$\frac{56}{7} = \square$

$42 \div 7 = \square$

$\begin{array}{r} \square \\ 7\overline{)35} \end{array}$

$\begin{array}{r} \square \\ 7\overline{)21} \end{array}$

$\frac{42}{7} = \square$

$\begin{array}{r} \square \\ 7\overline{)28} \end{array}$

$14 \div 7 = \square$

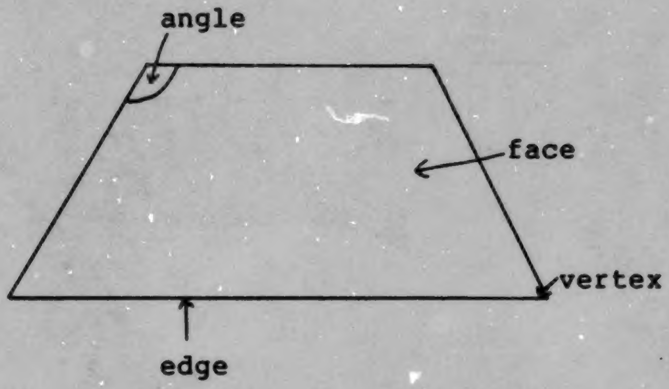
3.09.03 SOLID FIGURES

(2 lessons)

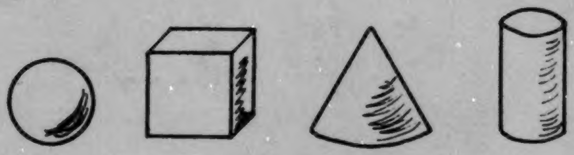
PERFORMANCE OBJECTIVES

The student will be able to...

3.09.03.01A identify vertex, edge, angle and face; e.g.,



3.09.03.02A define and identify a sphere, cube, cone and cylinder; e.g.,



3.09.03.03B construct solid figures using rulers, protractors and compasses. e.g.,

3.09.03

VOCABULARY

TERMS

angle
face
vertex
edge
sphere
cube
cone
cylinder
compass
protractor

GETTING STARTED

Divide the class into small groups. Prepare and distribute to each group at least one set of plastic shapes or attribute pieces, including one square, one rhombus, one rectangle, one triangle, and one circle.

Allow the students time to use the pieces to make a picture or examine the shapes. Hold up one shape and ask each student to pick up a shape. Say, "Touch a corner of your shape. Does anyone have a shape with no corners? How many corners does your shape have? Now touch the side of your shape. How many sides does your shape have?" Ask the students to pick up a different shape. Repeat the questioning using the new shapes.

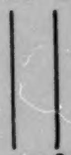
Prepare a few objects that have familiar shapes, e.g., carton, ball, tennis ball can, and an ice cream cone. Hold up the carton. Ask several students to touch the corners, and sides of the carton. Ask the students to count the number of corners and sides on the carton. Repeat for other objects. Ask the students if all shapes have sides and corners. (Not all shapes have corners.)

3.09.03

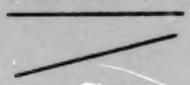
3.09.03.01 identify vertex, edge, angle and face

STRATEGY 1: Prepare and distribute to each student a set of plastic polygons. On the chalkboard draw a set of parallel lines and a set of lines that are not parallel but do not touch.

e.g.,



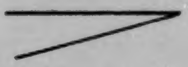
parallel



not parallel

Point to the parallel set and say, "If I continued these lines in either direction, would they meet?" Repeat the procedure for the non-parallel lines. Demonstrate by extending the bottom line until it touches the top line.

e.g.,



Say, "When two lines meet, they form an angle. The point where they meet is called the vertex." Ask the students to select a shape and find an angle and a vertex. Say, "How many angles? How many vertices? A face of a shape is the surface. Find a face on the shape. How many faces are on the shape?" Repeat this procedure for edges.

STRATEGY 2: Draw any angular figure on the chalkboard, e.g., trapezoid, triangle. Label all of the parts, e.g., vertex, angle, face and edge. Draw a different shape. Ask students to identify the vertices, angles, face and edges. Repeat this procedure using different shapes.

3.09.03

3.09.03.02 **define and identify a sphere, cube, cone and cylinder**

STRATEGY 1: Prepare the following objects: a ball, a block, an ice cream cone and an empty tennis ball can. Hold up the ball and say, "What is this? Does it have any edges, angles, vertices, faces? How would you describe this shape? What other objects have this shape? This shape is called a sphere." Repeat this procedure for the other objects.

STRATEGY 2: Prepare a set of large index cards with pictures of objects, e.g., megaphone, globe, can, carton, straw. Say, "Name the picture and identify the shape."

Display a real example of each of these figures, e.g., ice cream cone, empty can, ball, block. Hold up the block. Locate the angles, faces, vertices and edges on the shape.

Repeat this procedure for the other shapes using the appropriate terms.

3.09.03.03 **construct solid figures using rulers, protractors and compasses**

STRATEGY 1: Prepare and distribute a compass, ruler and protractor. Introduce the tools by name. Hold up a ball. Say, "We are going to draw a ball using only a pencil and a compass. When you look at a ball in a picture, what does it look like? Can you see every spot on the ball?" Demonstrate the construction of a circle on a large poster using a compass.

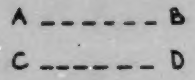
e.g.,

3.09.03

STRATEGY 1: cont'd

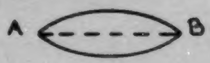
Ask the students to construct a circle on paper. Display a can and discuss the shape. Demonstrate the construction of a cylinder.

e.g.,



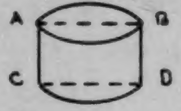
Using the compass, construct symmetrical arches on the top and bottom of the line.

e.g.,



Connect A to C and B to D using a ruler. Place the point of the compass on C. Move the pencil to D.

e.g.,



Ask the students to do the construction independently.

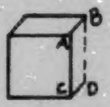
STRATEGY 2:

Prepare and distribute a compass, ruler and protractor to each student. Display a block. Say, "If we were to draw this shape, would you see all the faces and angles?" (No) You only see one side and part of one other side when the block is on a flat surface." Using the ruler, construct a square.

e.g.,

Draw a parellelogram on top of the square.

e.g.,



Draw $\overline{CD}$ and $\overline{BD}$ to complete the cube.

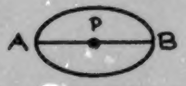
Have the students construct a cube in their notebooks.

Display a cone. Say, "How would this look if I were to draw it? Would you see the entire cone?" Using the compass, construct two arches, one upper

STRATEGY 2:
cont'd

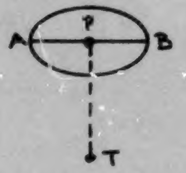
and one lower from A to B. (P is the midpoint of $\overline{AB}$.)

e.g.,



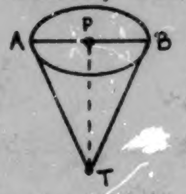
Use the ruler and draw a straight line down from point P.

e.g.,



Using the ruler, connect A to T and B to T.

e.g.,

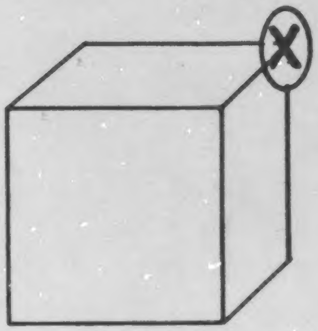


Ask the students to construct a cone on a rexograph sheet where given lines are drawn.

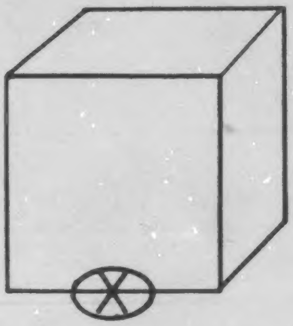
P.O. 3.09.03.01

NAME:______________________________ CLASS:__________ DATE:________

Write the word which tells where the X is placed on the block.

1


____

2


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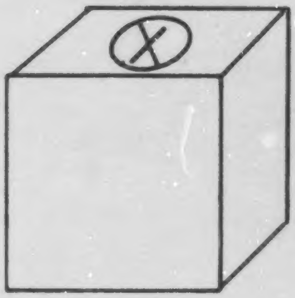
3


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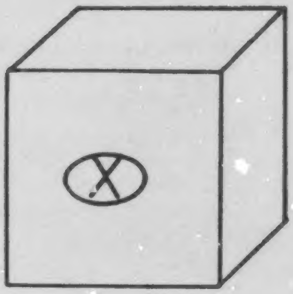
4


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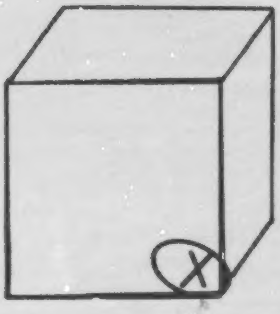
5


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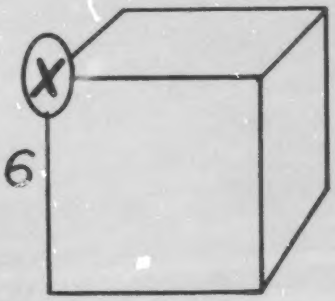
6


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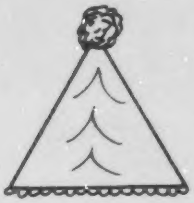
VERTEX FACE EDGE ANGLE

P.O. 3.09.03.02

NAME:______________________________ CLASS:__________ DATE:________

Write the correct word under each picture (cone, sphere, cylinder or cube).

1.



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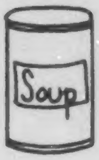
2.



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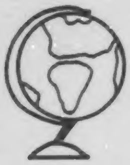
3.



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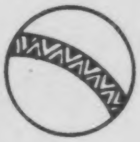
4.



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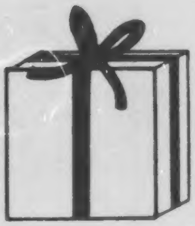
5.



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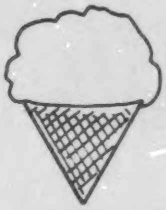
6.



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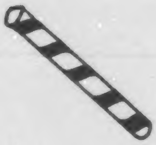
7.



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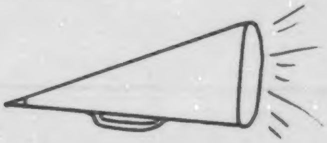
8.



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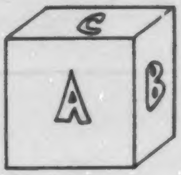
9.



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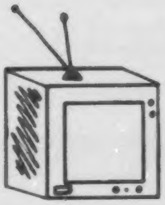
10.



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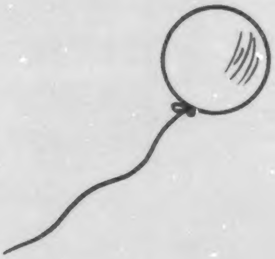
11.



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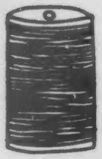
12.



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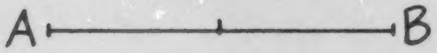
P.O.3.09.03.03

NAME:______________________________________ CLASS:________ DATE:_______

In each space construct the shape written at the top. You may use a protractor, ruler and compass. Some are started for you.

cone



cylinder

cube

sphere

3.09.04 COORDINATE POSITIONS

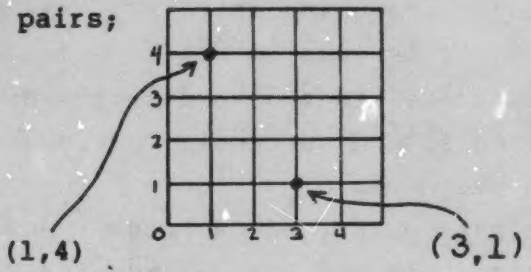
(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

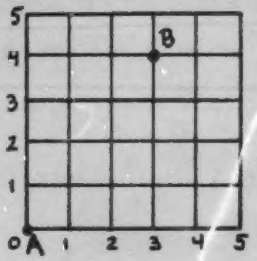
3.09.04.01A identify points on a grid by using ordered pairs;

e.g.,



3.09.04.02A give directions for getting from one place to another on a grid using horizontal and vertical paths.

e.g.,



What ordered pair goes with B? With A? Describe a path from A to B. (We may refer to these ordered pairs as addresses.)

3.09.04

VOCABULARY

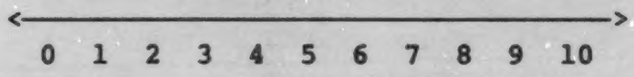
TERMS

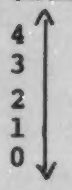
grid
ordered pairs
horizontal
vertical
address

GETTING STARTED

Say, "We are going to play a game using the tiles on the classroom floor. This game is about following directions. Before we play the game, there are two words with which you must be familiar. They are horizontal and vertical. Horizontal means left and right, and vertical means up and down." Ask one student to stand in the back left hand corner of the room. Say, "Move three (3) squares horizontally and six (6) squares vertically." Ask another student to go to the back left hand corner of the room and say, "Move seven (7) squares horizontally and eight (8) squares vertically. How would student one reach student two?" Elicit from the students that he/she would move four (4) squares horizontally and two (2) squares vertically. Repeat this procedure until every student has had an opportunity to move horizontally and vertically.

Draw a horizontal and a vertical number line on the chalkboard. e.g.,





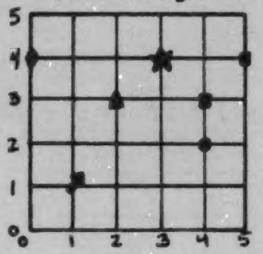
Point to the horizontal line. Say, "Count to the four. At what point will we be? We start at zero and counting to four brings us to point 4." Repeat this procedure using other numbers.

Repeat the above procedure using the vertical number line.

3.09.04

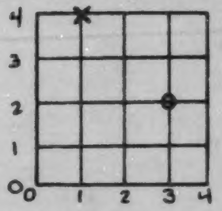
3.09.04.01 identify points on a grid by using ordered pairs

STRATEGY 1: Duplicate the following and distibute to the students.
e.g,



Say, "This is called a grid. How would you tell someone where to find the star on this grid?" (The star is 3 boxes horizontally and 4 boxes vertically.) Say, "Whenever we give directions on a grid we give the horizontal first. The directions can be written as 3,4." Ask the students to locate the other items on the grid and record the ordered pairs on the paper.

STRATEGY 2: Draw a grid on the chalkboard. Say, "We are going to play a variation of Tic Tac Toe. Instead of writing X's or O's in the box we are going to write them at the corner of the box."
e.g.,



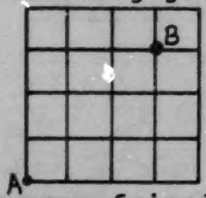
Say, "The object of the game is to get three X's or three O's in a row horizontally, vertically or diagonally. You may not come to the chalkboard. You must tell me where to put the X or O." Divide the class into two teams, X and O. O goes first. The first student must indicate, by using the numbers on the grid, the position for O, e.g., (4,2). Record each O and X as the students give the locations. If, by error, the student gives the vertical number first, record it as given. Repeat this game.

3.09.04

3.09.04.02 **give directions for getting from one place to another on a grid using horizontal and vertical paths**

STRATEGY 1: Draw the following grid on the chalkboard.

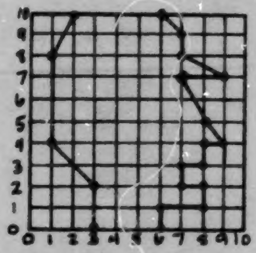
e.g.,



Say, "A is your friend. B is you. Your friend wants to come and see you. What would you tell your friend to do?" (A would have to move (3,3) in order to get to B.) Change the positions of A and B and repeat the procedure. Say, "We call the ordered pair the address. What is the address for A and for B?" Elicit from the students that A's address is (0,0) and B's address is (3,3).

STRATEGY 2: Duplicate the following.

e.g.,

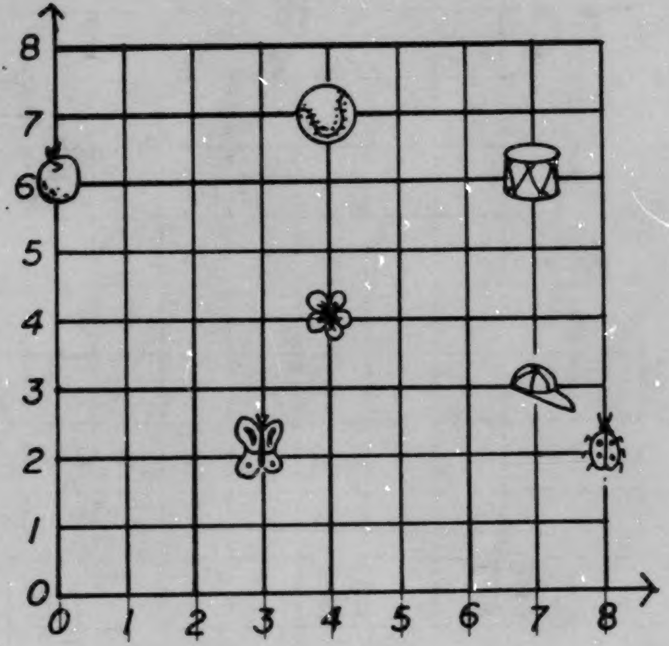


Say, "This picture is a puzzle. We are going to write the directions so that a student can duplicate this picture on a blank grid. Point A is the starting point. Write the directions for this picture." Elicit the directions from the students beginning with (3,0), and continuing with (6,0), (6,1), (8,1) until (3,0).

P.O.3.09.04.01

NAME:____CLASS:________DATE:_______

Write the ordered pairs for the objects on the grid.


8
7
6
5
4
3
2
1
0
0
1
2
3
4
5
6
7
8

Apple _____

Butterfly_____

Drum _____

Flower _____

Cap _____

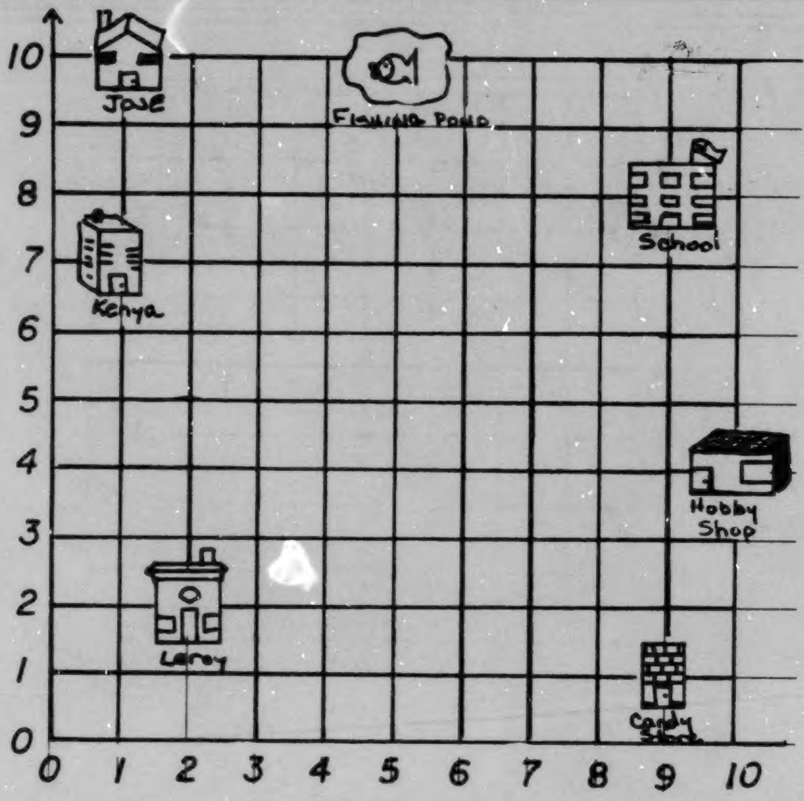
Beetle_____

Cupcake____

P.O. 3.09.04.02

NAME:__________________________________CLASS:_________DATE:________

Use the grid to answer the questions.


Jose
Fishing Pond
School
Kenya
Hobby Shop
Leroy
Candy Store
0
1
2
3
4
5
6
7
8
9
10

1. How can Leroy get to school? ____________________

2. How can Kenya get to the fishing pond? ________________

3. How can Jose go to Leroy's house? ______________

4. Is there another way? ________________

5. Mary went from Kenya's house to the hobby shop. How did she go? __________________.

6. How do you go from the candy store to school?

3.04.07 MULTIPLICATION OF EIGHTS AND NINES

(3 lessons)

PERFORMANCE OBJECTVES

The student will be able to...

3.04.07.01B multiply eight by the numbers one (1) through nine (9) using vertical and horizontal formats;

e.g.,

$$\begin{array}{r} 8 \\ \times\ 1 \\ \hline 8 \end{array} \qquad \begin{array}{r} 8 \\ \times\ 2 \\ \hline 16 \end{array} \qquad \begin{array}{r} 8 \\ \times\ 3 \\ \hline 24 \end{array}$$

$1 \times 8 = 8$

$2 \times 8 = 16$

$3 \times 8 = 24$

3.04.07.02B multiply nine by the numbers one (1) through nine (9) using vertical and horizontal formats;

e.g.,

$$\begin{array}{r} 9 \\ \times\ 1 \\ \hline 9 \end{array} \qquad \begin{array}{r} 9 \\ \times\ 2 \\ \hline 18 \end{array} \qquad \begin{array}{r} 9 \\ \times\ 3 \\ \hline 27 \end{array}$$

$1 \times 9 = 9$

$2 \times 9 = 18$

$3 \times 9 = 27$

3.04.07.03B apply the commutative property of multiplication to the eight and nine times tables;

e.g.,

$8 \times 9 = 72$

$9 \times 8 = \square$

$9 \times 8 = 8 \times 9$

$8 \times 9 = \square \times 8$

3.04.07.04B solve word problems related to skills learned in this module.

e.g.,

There are 6 shelves with 8 books on each shelf. How many books are there in all?

$6 \times 8 = 48$ books

3.04.07

VOCABULARY

TERMS

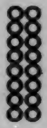
product
multiplicand
multiplier

GETTING STARTED

Prepare a class set of flashcards with multiplication facts from 1 four through 5 fours. Going around the classroom, ask each student to give the answer orally.

Ask the students to draw objects or dots to represent a multiplication fact for the two times table through the four times table. Say, "Write the algorithm horizontally and vertically for each picture."

e.g.,

Draw 8 twos:  8 x 2 = 16 $\begin{array}{r} 8 \\ \underline{\text{x}2} \\ 16 \end{array}$

Repeat this procedure drawing other pictures.

3.04.07

3.04.07.01 **multiply eight by the numbers one (1) through nine (9) using vertical and horizontal formats**

STRATEGY 1: Prepare and distribute a sheet of drawing paper to each student. Ask the students to draw two sets of eight hearts with each set of eight circled. Say, "How many hearts do we have?" Ask a student to state the multiplication equation that describes the hearts. Write on the chalkboard.

e.g.,

$$2 \times 8 = 16 \qquad \begin{array}{r} 8 \\ \underline{\times 2} \\ 16 \end{array}$$

Ask two other students to read the equation (two eights are sixteen). Repeat this procedure using other facts of eight.

STRATEGY 2: Ask three students to come to the front of the room. Ask each student to choose eight items from a box. Say, "How many students do we have? (3) How many items does each student have?" (8) Ask the students up front to count how many objects they have altogether. (24) Ask a student to state the multiplication equation that describes the number of students up front and the items they are holding. Write the equation horizontally and vertically on the chalkboard.

e.g.,

$$3 \times 8 = 24 \qquad \begin{array}{r} 8 \\ \underline{\times 3} \\ 24 \end{array}$$

Ask other students to read the equations (three eights are twenty-four). Repeat this procedure using other facts of eight.

3.04.07.02 **multiply nine by the numbers one (1) through nine (9) using vertical and horizontal formats**

STRATEGY 1: Write two multiplication sentences on the chalkboard.

3.04.07

STRATEGY 1: cont'd

e.g.,

$$4 \times 9 = 36 \qquad \begin{array}{r} 9 \\ \underline{x4} \\ 36 \end{array}$$

Say, "How are these examples the same? How are they different?" Draw arrows to indicate the horizontal and vertical format.

e.g.,

↔ ↕

Say, "When the arrow points up and down we write the sentence vertically." Repeat for the horizontal format.

Ask three (3) students to come to the front of the room. Ask each student to hold up nine (9) fingers. Ask a student to count the total number of fingers. Ask another student to write the number sentence to show this representation.

e.g.,

$$3 \times 9 = 27 \qquad \begin{array}{r} 9 \\ \underline{x3} \\ 27 \end{array}$$

Repeat this procedure for other facts of nine.

STRATEGY 2: Prepare and display two groups, each having nine magnetic discs on the chalkboard. Say, "There are two groups of nine circles.

e.g.,

ooooooooo
ooooooooo

Ask a student to come to the chalkboard and write a number sentence representing the array.

e.g.,

$$2 \times 9 = 18 \qquad \begin{array}{r} 9 \\ \underline{x2} \\ 18 \end{array}$$

Repeat this procedure for all of the facts of nine.

3.04.07.03 **apply the commutative property of multiplication to the eight and nine times tables**

STRATEGY 1: Adapt Strategy 1 used in P.O. 3.04.07.02 for applying the commutative property to the eight times table.

STRATEGY 2: Use magnetic discs to make the following array.

```
      OOOOOOOO
e.g., OOOOOOOO
```

Say, "How many discs do we have in each row across? How many rows do we have? How many discs do we have?" (There are two rows, eight discs in each row and 16 discs) Write 2x8 = 16. Then swing the discs around to make this configuration.

```
     O O
e.g, O O
     O O
     O O
     O O
     O O
     O O
     O O
```

Say, "How many discs are in each row across? How many rows do we have? How many discs do we have?" (8 rows, 2 discs in each row and 16 discs) Write 8x2 = 16.

Repeat this procedure.

3.04.07.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Present the following problem to the students.

> Michael has a stamp album. There are 8 stamps on a page. If he has filled 4 pages with stamps, how many stamps does he have?

Ask the students to solve the problem using the steps for good problem solving.

Repeat this procedure using problems related to the students and their interests.

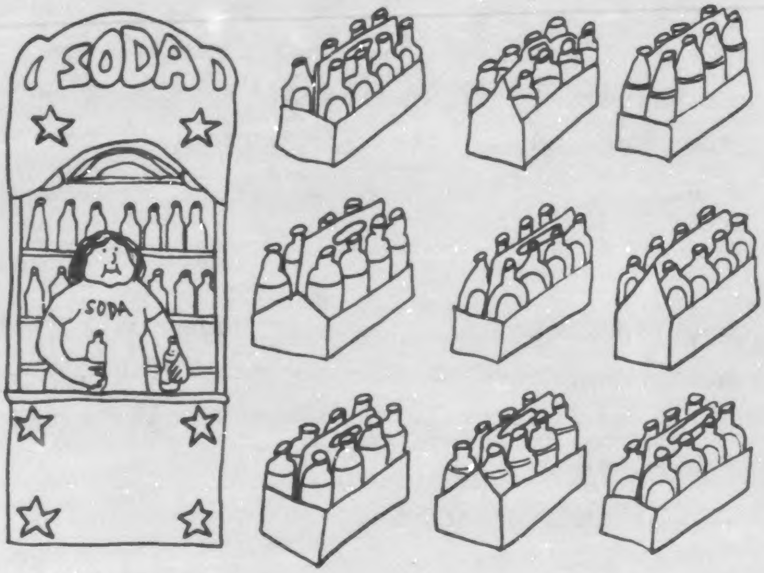
STRATEGY 2: Say, "We are going to write our own math test. Each student must write a problem using one of the multiplication facts for eight. We will put these problems into a booklet which you can take home. Remember to try to solve your problem." Collect the problems and distribute to the other students.

Repeat this procedure several times, and for facts for nine.

P.O. 3.04.07.01

NAME: ______________________ **CLASS:** ________ **DATE:** ________

Solve each equation.
Color the picture.



1. 2 × 8 = ______
2. 4 × 8 = ______
3. 5 × 8 = ______
4. 3 × 8 = ______
5. 1 × 8 = ______
6. 9 × 8 = ______
7. 7 × 8 = ______
8. 8 × 8 = ______
9. 2 × 8 = ______
10. 1 × 8 = ______
11. 5 × 8 = ______
12. 3 × 8 = ______
13. 6 × 8 = ______
14. 4 × 8 = ______
15. $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$
16. $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$
17. $\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$
18. $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$
19. $\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$
20. $\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$

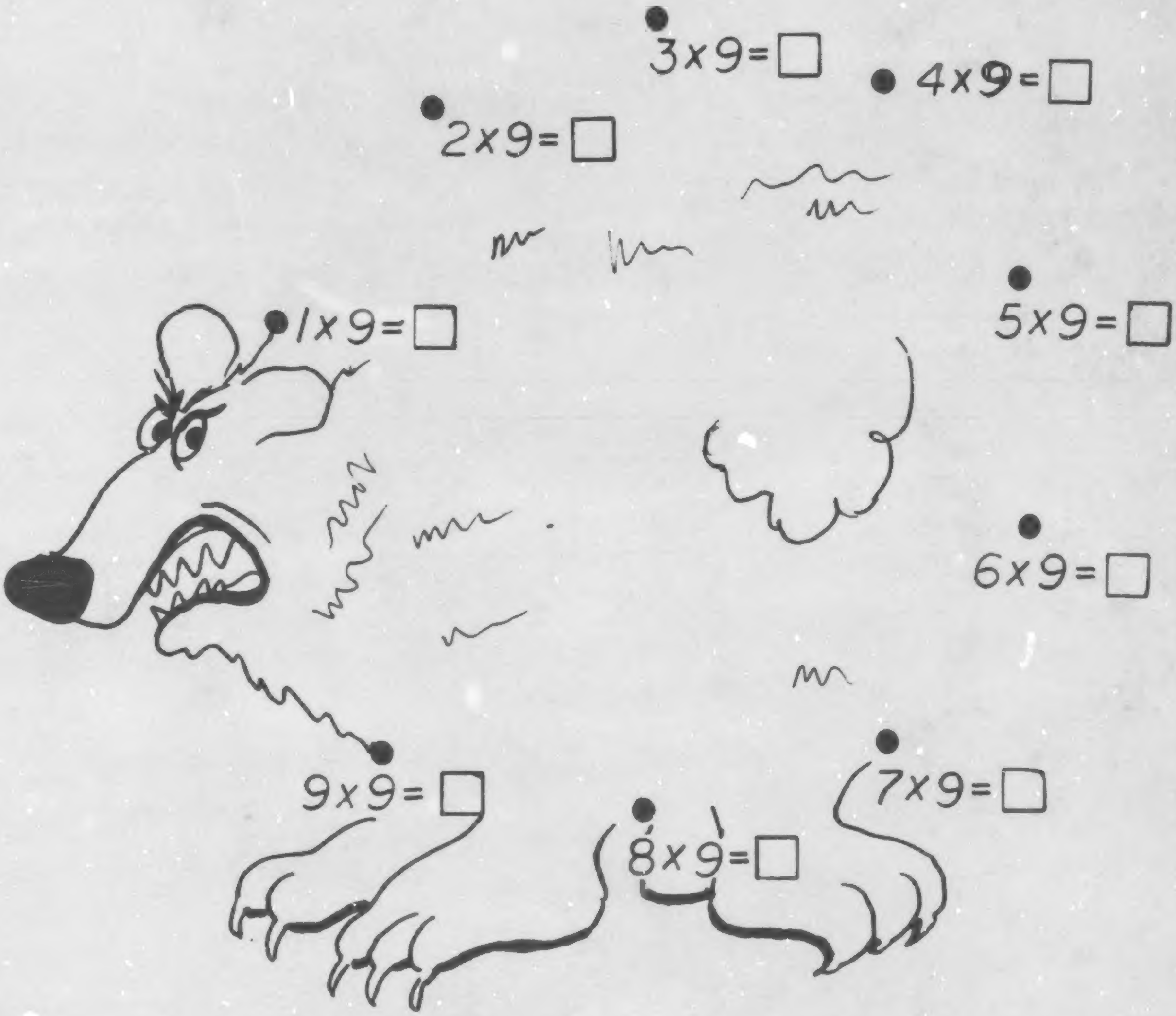
Top Score = 20 (100%)
My Score = ____ (   )

P.O. 3.04.07.02

NAME: ______________________ CLASS: __________ DATE: ________

Write the products in the boxes.
Connect the dots in order.

WRITE THE PRODUCTS IN THE BOXES.
CONNECT THE DOTS IN ORDER.



1x9=☐

2x9=☐

3x9=☐

4x9=☐

5x9=☐

6x9=☐

7x9=☐

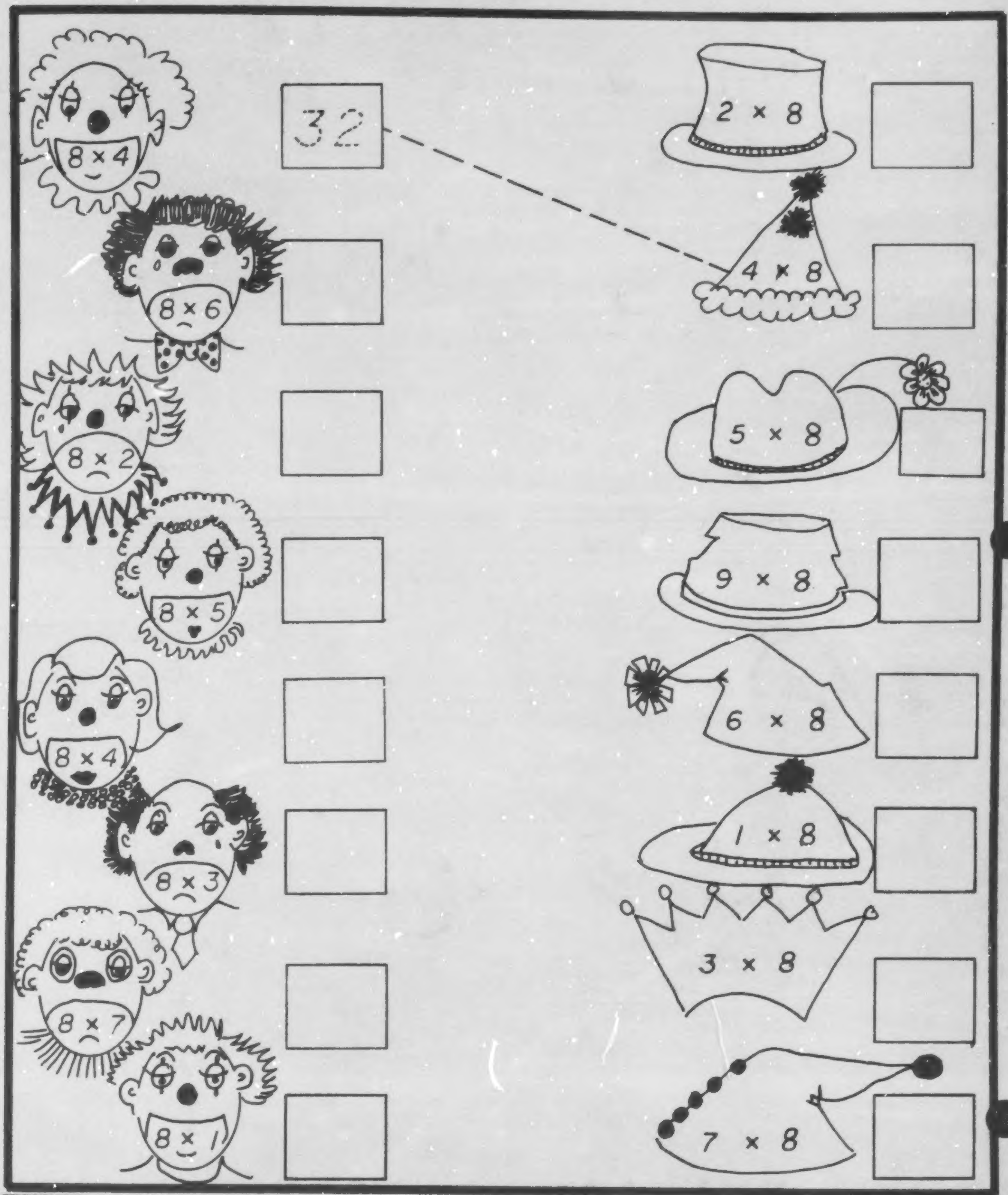
8x9=☐

9x9=☐

P.O. 3.04.07.03

NAME:______________________________ CLASS:________ DATE:________

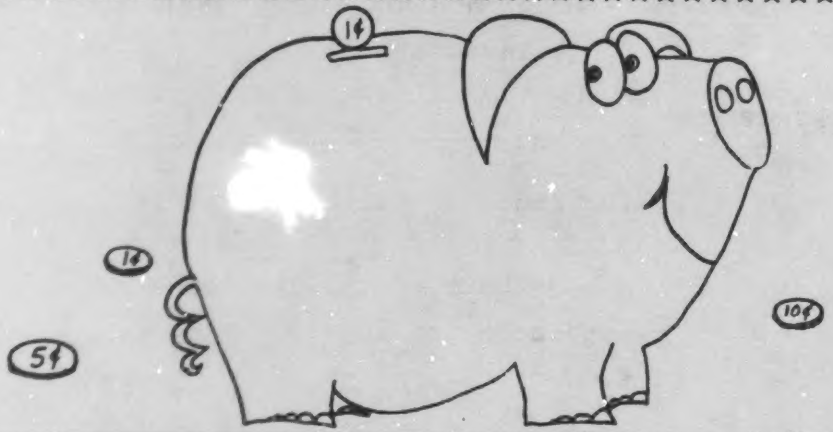
Match the clown to his hat.
Write the answer to the problem.


8 × 4
32
8 × 6
8 × 2
8 × 5
8 × 4
8 × 3
8 × 7
8 × 1
2 × 8
4 × 8
5 × 8
9 × 8
6 × 8
1 × 8
3 × 8
7 × 8

P.O. 3.04.07.04

NAME: ________________________ **CLASS:** ________ **DATE:** ______

Solve each problem.



	Work Here
Betty bought 2 pencils. Each pencil cost 6¢. How much did she spend? ________	
John has 6 nickels. How much money does he have? ________	
Sue bought 6 pens. Each pen cost 7¢. How much did she spend? ________	
Paul, Mike, Steve and Mark each have 6¢. How much money do they have altogether? ________	
Mary earns 6¢ everyday. How much money does she earn in 3 days? ______ 5 days? ______ 8 days? ______ 9 days? ______	

Unit 40

3.05.05 DIVISION OF WHOLE NUMBERS (EIGHTS THROUGH SEVENTY-TWO, NINES THROUGH EIGHTY-ONE)

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.05.01B divide by 8, using dividends to 72, without a remainder;

e.g.,

$16 \div 8 = 2$ $\begin{array}{r} 2 \\ 8\overline{)16} \end{array}$ $\frac{16}{8} = 2$

$24 \div 8 = 3$ $\begin{array}{r} 3 \\ 8\overline{)24} \end{array}$ $\frac{24}{8} = 3$

$40 \div 8 = 5$ $\begin{array}{r} 5 \\ 8\overline{)40} \end{array}$ $\frac{40}{8} = 5$

$64 \div 8 = 8$ $\begin{array}{r} 8 \\ 8\overline{)64} \end{array}$ $\frac{64}{8} = 8$

3.05.05.02B divide by 9, using dividends to 81, without a remainder.

e.g.,

$18 \div 9 = 2$ $\begin{array}{r} 2 \\ 9\overline{)18} \end{array}$ $\frac{18}{9} = 2$

$27 \div 9 = 3$ $\begin{array}{r} 3 \\ 9\overline{)27} \end{array}$ $\frac{27}{9} = 3$

$63 \div 9 = 7$ $\begin{array}{r} 7 \\ 9\overline{)63} \end{array}$ $\frac{63}{9} = 7$

$81 \div 9 = 9$ $\begin{array}{r} 9 \\ 9\overline{)81} \end{array}$ $\frac{81}{9} = 9$

3.05.05

VOCABULARY

TERMS	SYMBOLS
division	$y\overline{)x}$, $x \div y$, $\frac{x}{y}$
divisor dividend quotient	

GETTING STARTED

Write the following on the chalkboard.
e.g.,

Divide by 6	
12	2
54	
36	
42	

Say, "Each number in the first column can be divided by 6." Ask a student to read the first division example. Write the example on the chalkboard, e.g., $12 \div 6 = \quad$. Ask another student to find the quotient. Write the quotient on the chalkboard. Point to the second number. Say, "What number sentence can we write?" Write the appropriate number sentence on the chalkboard. Ask the students to complete the equation. Complete the chart. Repeat this procedure using other division facts through $63 \div 7$.

Prepare and distribute 24 chips to each student. Say, "Place these chips in groups of four. How many groups of four were you able to make with the chips?" (6) Ask a student for the number sentence which describes the representation. Write the number sentence on the chalkboard, e.g., $24 \div 4 = 6$. Say, "The same example can be written in other ways." Write the other forms on the chalkboard.
e.g.,

$$24 \div 4 = 6 \qquad \begin{array}{r} 6 \\ 4\overline{)24} \end{array} \qquad \frac{24}{4} = 6$$

Repeat this procedure.

3.05.05

3.05.05.01 **divide by 8, using dividends to 72, without a remainder**

STRATEGY 1: Prepare a flannel board and sets of felt fractional pieces divided into eighths. Display eight parts as a whole. Say, "Count the number of parts in the whole." Write 8 on the chalkboard. Ask 8 students to come to the front of the room. Say, "Pretend that each piece is a piece of pie. I am going to divide the pieces of pie evenly among these students. How many pieces of pie will each student receive?" Distribute one piece to each student.

Write 8 ÷ 8 = 1 on the chalkboard and ask the students to copy it into their notebooks. Place 2 "pies" on the flannel board. Repeat the procedure dividing up the pie, e.g., 16 ÷ 8 = 2. Write the corresponding division sentence on the chalkboard. Repeat this procedure through the remaining facts of eight through 9 eights.

STRATEGY 2: Prepare a set of cubes. Display 8 cubes in front of the room. Say, "How many groups of 8 can we make from this set?" (1) Draw the division symbol on the chalkboard. Ask the students where each number should be placed. Ask the students to copy the example in their notebooks.

e.g.,

$$\begin{array}{r} 1 \\ 8\overline{)8} \end{array}$$

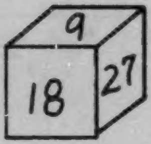
Repeat this procedure using other division facts of 8.

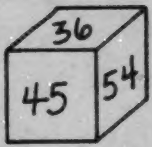
3.05.05

3.05.05.02 **divide by 9, using dividends to 81, without a remainder**

STRATEGY 1: Prepare two cubes with the multiples of nine written on each face.

e.g.,

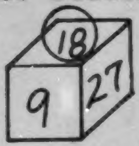




Say, "Throw one cube. The number that appears on top is to be divided by nine. Write and solve the division example." Ask a student to write the completed number sentence on the chalkboard. If his/her answer is correct, then that student tosses the cube for the other students.

e.g.,

number to be
divided by 9



18 ÷ 9 = 2

Repeat this procedure for the basic facts of nine. Ask the students to copy the division facts into their notebooks.

STRATEGY 2: Place the following headings on the chalkboard.

e.g.,

÷ $\overline{)\quad}$ ——

Draw 9 circles on the chalkboard. Ask a student to count the circles. Ask another student to draw a ring around groups of nine. Say, "How many groups of 9 were we able to form?" (1) The problem can be written as a division example in three different ways."

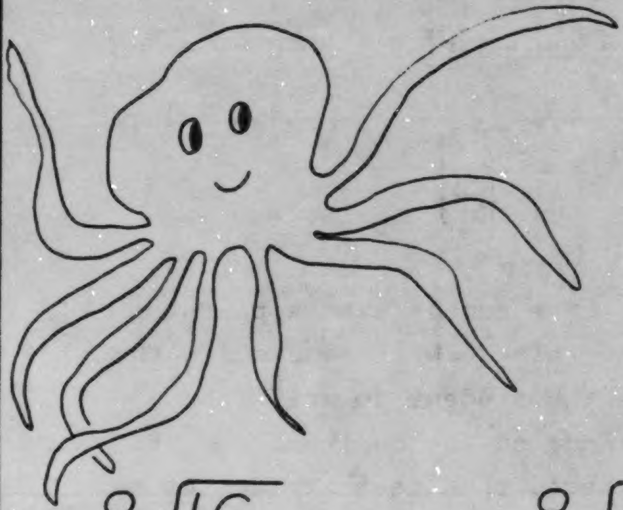
Write each example under the appropriate heading.

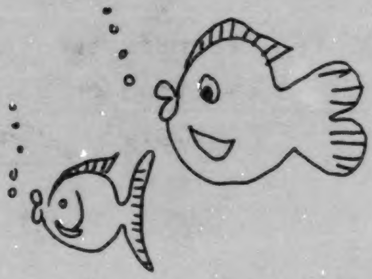
Repeat this procedure for other facts for nine. Ask the students to copy the completed chart into their notebooks.

P.O. 3.05.05.01

NAME: ______________________________ **CLASS:** ________ **DATE:** ________

Find the missing numbers.





$8\overline{)16}$ $8\overline{)32}$ $8\overline{)8}$

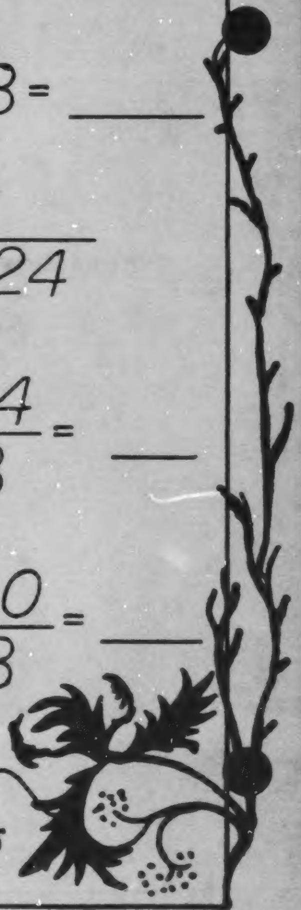
$16 \div 8 =$ ____ $32 \div 8 =$ ____ $8 \div 8 =$ ____

$8\overline{)72}$ $8\overline{)48}$ $8\overline{)24}$

$\frac{72}{8} =$ ____ $\frac{48}{8} =$ ____ $\frac{24}{8} =$ ____

$\frac{64}{8} =$ ____ $\frac{56}{8} =$ ____ $\frac{40}{8} =$ ____

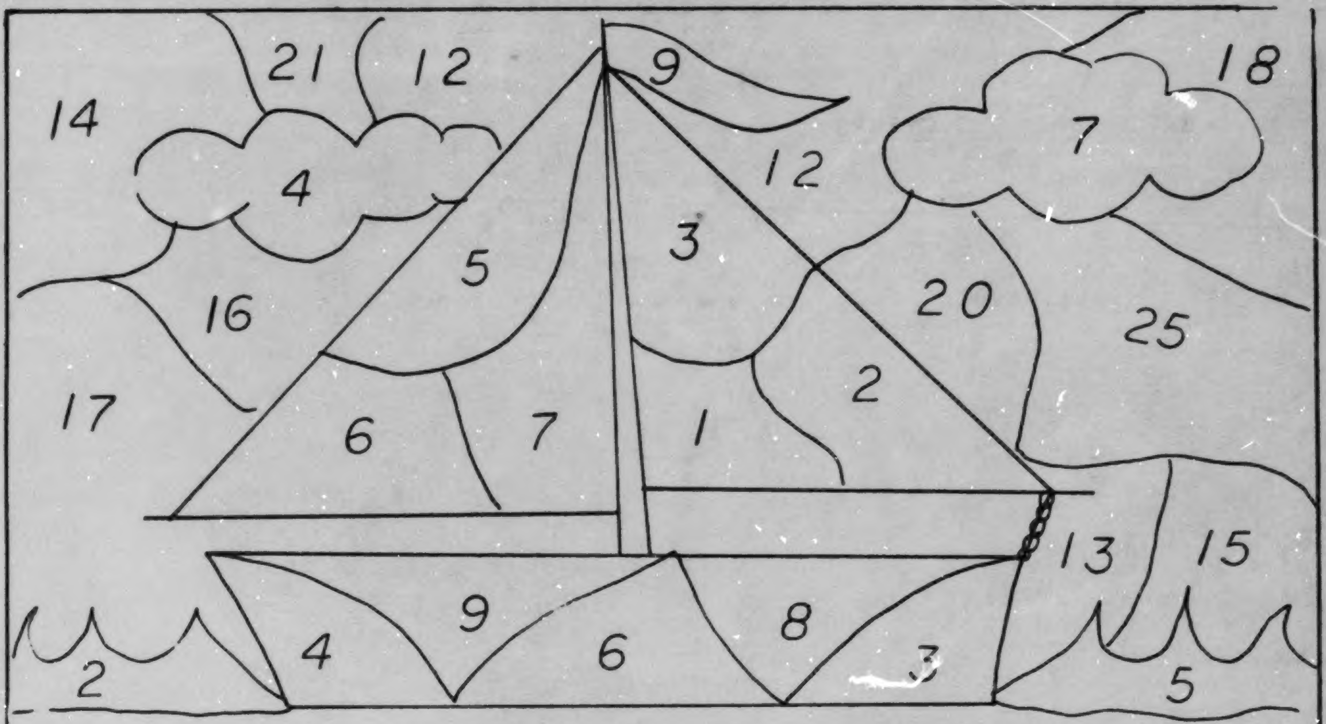
$56 \div 8 =$ ____ $64 \div 8 =$ ____ $40 \div 8 =$ ____



P.O. 3.05.05.02

NAME: ______________________ **CLASS:** __________ **DATE:** ________

Correct quotient.
Divide.
Find the quotients in the picture and color them.

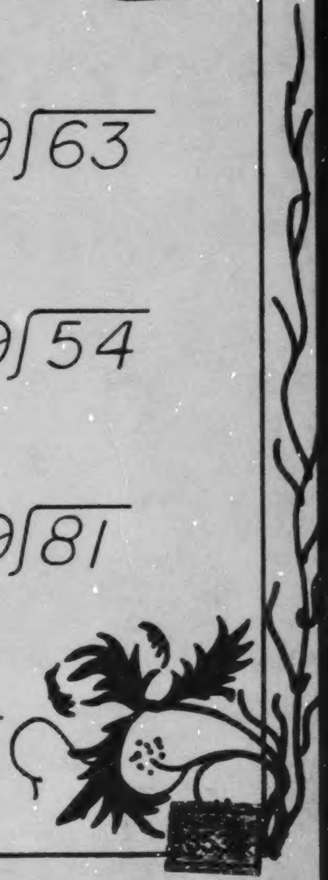

21
12
9
18
14
7
4
12
3
5
20
16
25
2
17
6
7
1
13
15
9
8
4
6
3
2
5

27÷9= ☐ 54÷9 = ☐ 81÷9 = ☐ $9\overline{)63}$

45÷9= ☐ 72÷9 = ☐ $9\overline{)18}$ $9\overline{)54}$

9 ÷ 9= ☐ 18÷9 = ☐ $9\overline{)36}$ $9\overline{)81}$

36÷9- ☐ 63÷9 = ☐ $9\overline{)45}$ $9\overline{)27}$



3.11.01 OPEN SENTENCES

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.11.01.01A read and write open number sentences; e.g.,

$$\square + 63 = 66$$

3.11.01.02A complete an open number sentence. e.g.,

$$7 + 3 = \square$$
$$\square + 3 = 21$$
$$7 + \square = 21$$
$$3 \times 7 = \square$$
$$21 \div 3 = \square$$
$$21 \div 7 = \square$$
$$\square \div 3 = 7$$

354

3.11.01

VOCABULARY

TERMS

open number sentence

GETTING STARTED

Prepare a class set of index cards with simple incomplete sentences on each card.

e.g.,

Jack and Jill went up the ________.

Go around the room and ask each student to read a sentence and add the missing word. Repeat this procedure until all of the students have had a chance to answer.

Present numbers written in sequential order leaving out one number. Ask the students to identify the missing number.

e.g.,

1, 2, 3, __, 5, 6, 7

10, 11, 12, __, 14, 15

0, 2, 4, 6, __, 10, 12

15, 14, 13, __, 11, 10

3.11.01

3.11.01.01 read and write open number sentences

STRATEGY 1: Prepare a shoe box and counting blocks. Place ten blocks in the box. Ask one student to come up and add five blocks without letting the other students see how many blocks he/she put in the box. Empty the box and ask a child to count the blocks.

Say, "We started with ten blocks. Now we have 15 blocks. How can we write a number sentence about this?" Write 10 + = 15 on the chalkboard.

Continue this procedure with the following.
e.g.,

$$\square + 5 = 15$$
$$5 + 10 = \square$$

STRATEGY 2: Say, "I have six pencils. Someone gave me some extra pencils and now I have ten pencils. We can write a number sentence that tells about this story. We know we started with six pencils." Write 6 on the chalkboard. Say, "We had ten after we got some more." Write 6 + = 10 on the chalkboard. Ask a student to read the sentence.

Repeat this procedure using other stories and asking different students to read and write the appropriate number sentences.

3.11.01

3.11.01.02 **complete an open number sentence**

STRATEGY 1: Prepare a set of index cards with one open sentence on each, e.g., $24 + \square = 28$. Prepare another set with one answer on each card, e.g., 4. Distribute a card to each student. Ask a student to read his/her open sentence. Ask the student with the correct answer to show his/her card. Repeat this procedure for all open sentence cards.

STRATEGY 2: Play the game "Concentration". Make a set of cards with one open sentence on each, and a set of cards with one answer on each. Number the back of each card and place them face down on a table. Ask a student to choose two cards.

e.g.,

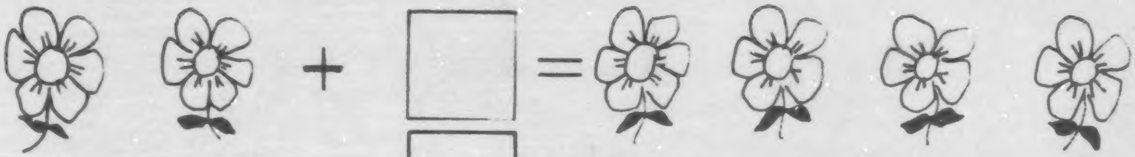
$\boxed{15 + \square = 19}$ $\boxed{4}$ match

If the cards match, the student goes again. If not, another student takes a turn.

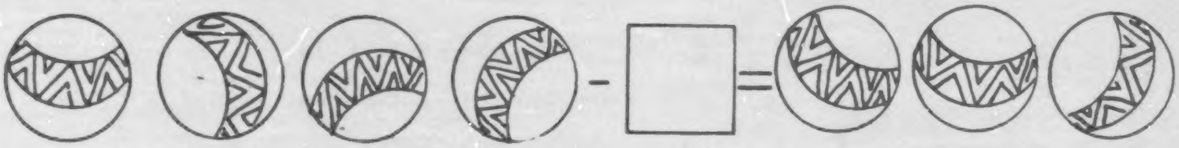
P.O. 3.11.01.01

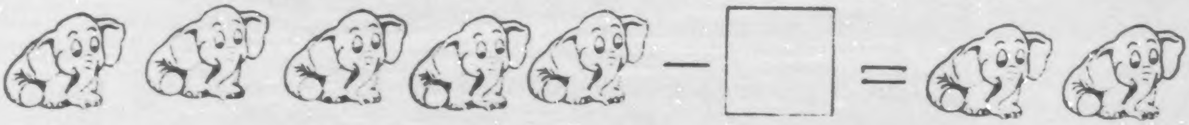
NAME: ______________________ CLASS: __________ DATE: ________

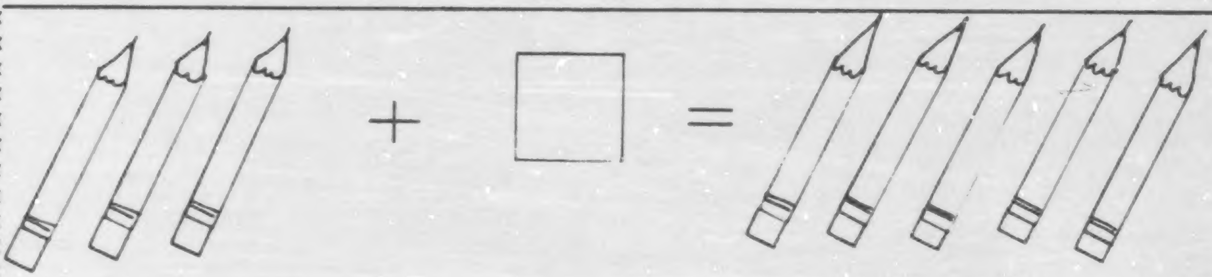
Write the open number sentence for each group.

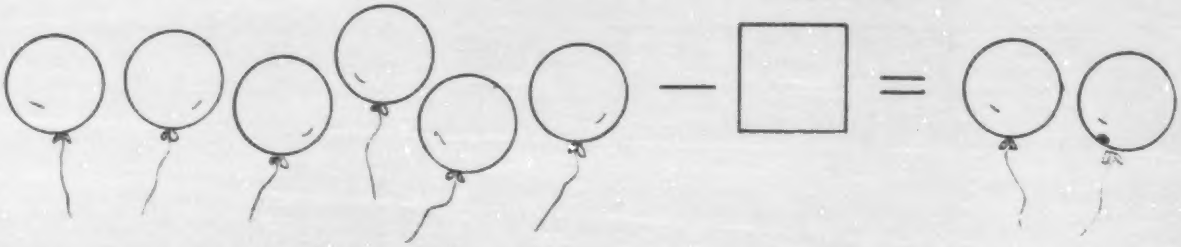


2 + ☐ = 4





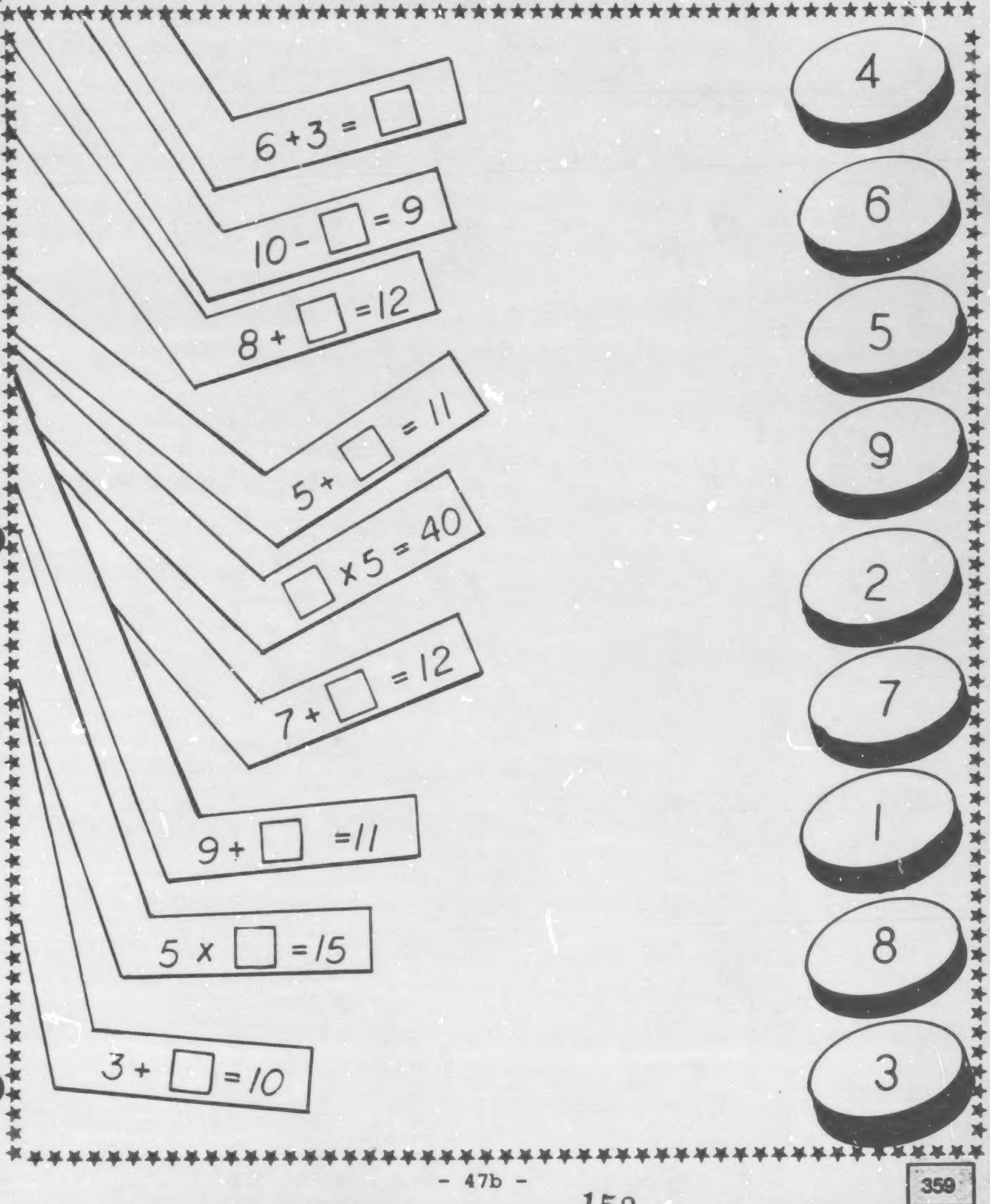




P.O. 3.11.01.02

NAME: ______________________ CLASS: __________ DATE: ________

Score a goal. Hit the puck with the hockey stick by matching the open sentence to the number that completes it.


6 + 3 = ☐
10 - ☐ = 9
8 + ☐ = 12
5 + ☐ = 11
☐ × 5 = 40
7 + ☐ = 12
9 + ☐ = 11
5 × ☐ = 15
3 + ☐ = 10
4
6
5
9
2
7
1
8
3

3.11.02 INEQUALITIES

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.11.02.01A read and write addition and multiplication inequalities;
e.g.,

$\square + 6 < 8$

$\square \times 2 < 11$

3.11.02.02A find the solution set for an inequality.
e.g.,

$\square + 8 < 11$

Solution Set = 0, 1, 2

$\square \times 2 < 10$

Solution Set = 0, 1, 2, 3, 4

3.11.02

VOCABULARY

TERMS	SYMBOLS
greater than	$>$
less than	$<$
solution set	$\{0,2,4,\}$

GETTING STARTED

Cut out three cardboard representations of the symbols greater than (>), less than (<) and equal to (=). Tape the symbol > on the chalkboard. Say, "What does this sign represent?" (greater than) Write a 3-digit number to the left side of the symbol, and a number less than 3-digits to the right side of the symbol, e.g., 413 > 27. Say, "Is this statement true?"

Repeat this procedure with the symbols < and =.

Draw the symbols >, <, and = on the chalkboard. Ask the students what each of the symbols represents. Illustrate each with an example. Distribute five chips to each student. Instruct students to place two chips in one group and the remaining three chips in another. Ask students which group has fewer chips. Ask the students to write a statement showing that two chips is less than three chips. Ask a student to write the inequality at the chalkboard, e.g., 2 < 3. Instruct the students to rearrange the five chips into other groups and write the inequality for each arrangement. Write the different statements of inequality that the students have discovered on the chalkboard.

3.11.02

3.11.02.01 **read and write addition and multiplication inequalities**

STRATEGY 1: Prepare and distribute chips. Say, "Separate the chips into two groups, one group consisting of 5 chips and the second group consisting of 7 chips." Draw the representation on the chalkboard. Say, "Does the first group have more or less chips than the second group?" Ask a student to write the inequality on the chalkboard.

e.g.,

$5 < 7$

Say, "Can any other chips be added to the first group and still make the statement true? Before we find out the answer, we can write a number sentence. Since the answer is unknown, we will represent it with a box. To what number are we adding this? (5) What does the $\square + 5$ have to be less than?" (7) Write $\square + 5 < 7$ on the chalkboard. Ask a student to read the sentence.

Repeat this procedure using addition and multiplication inequalities.

STRATEGY 2: Write the following inequality on the chalkboard, $\square + 2 < 5$. Point to the inequality and say, "This statement is asking us what number or numbers can be added to 2 which will result in an amount that is less than 5. We read this statement as plus two is less than five." Write another addition inequality on the chalkboard. Ask the students what the statement is asking. Ask the students to copy the inequality into their notebooks. Change the procedure so that students will gain experience in writing inequalities as well as in reading them. Use this procedure for multiplication inequalities.

3.11.02

3.11.02.02 **find the solution set for an inequality**

STRATEGY 1: Prepare and distribute chips. Write the inequality + 7 < 11 on the chalkboard. Ask a student to read the statement. Say, "Form a group of 7 and a group of 11 using the chips. Can we add any other chips to the first group and and still have less than 11? In number sentences like these, more than one answer can be correct." Write the words "Solution Set" and draw brackets (the symbol for solution set) on the chalkboard.

e.g.,

Solution Set = $\{\quad\}$

Say, "In order for a number to be included in the solution set it must make the statement true." Write the students' responses on the chalkboard.

e.g.,

□ + 7 < 11

Solution Set = 0,1,2,3

Repeat this procedure using a multiplication inequality.

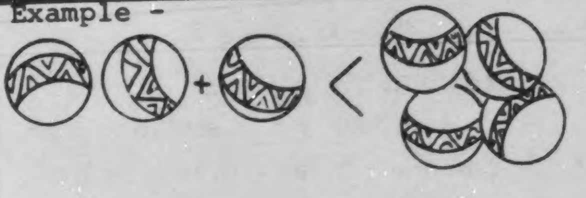
STRATEGY 2: Write the following inequality on the chalkboard, □ x 2 < 12. Say, "What is the statement asking?" Write the words and symbol for a solution set on the chalkboard, e.g., Solution Set = $\{\quad\}$. Ask the students to write the two times table on a piece of paper. Say, "Is zero times two less than 12?" Write the number zero in the solution set. Repeat this procedure for the other members of the two times table. Ask a student to read the inequality and its corresponding solution set. Adapt this strategy for finding the solution set of an addition inequality.

P.O. 3.11.02.01

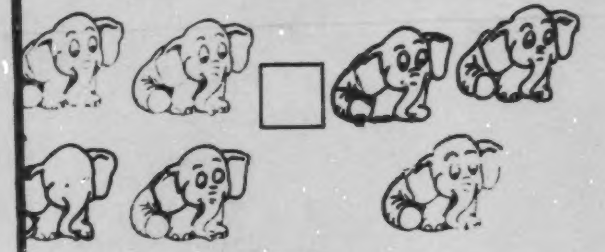
NAME: ______________________ CLASS: __________ DATE: __________

Complete each statement by using the symbols > or <

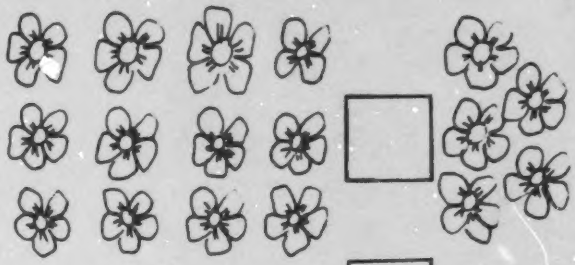
Example -



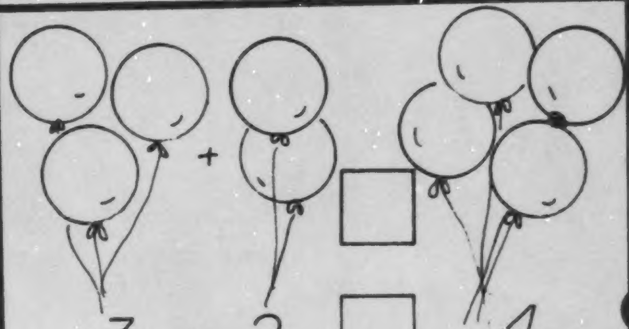
2 + 1 < 4



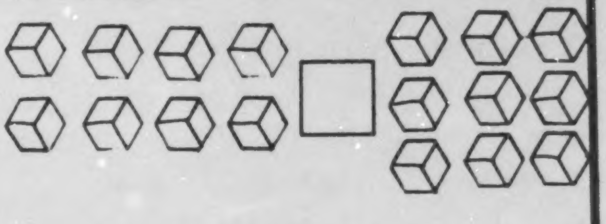
2 2 ☐ 3



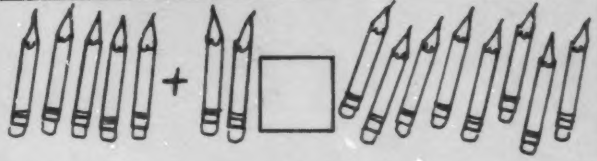
3 × 4 ☐ 5



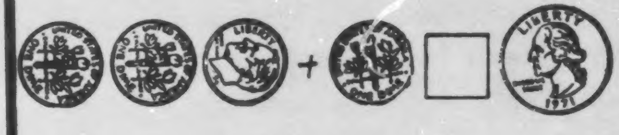
3 + 2 ☐ 4



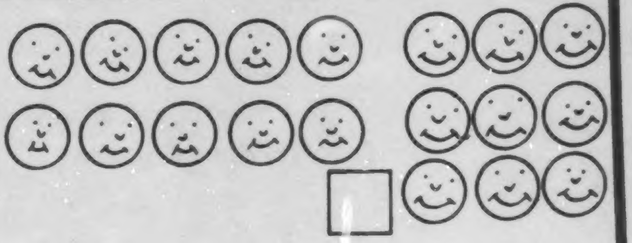
2 × 4 ☐ 9



5 + 2 ☐ 8



30¢ + 10¢ ☐ 25¢



2 × 5 ☐ 9

P.O. 3.11.02.02

NAME: ______________________ CLASS: __________ DATE: ________

Find the solution set for each problem.

example:

$\bigcirc + 4 < 10$

Solution set = {0, 1, 2, 3, 4, 5}

$\bigcirc \times 3 > 5$

Solution set = { ______ }

$\bigcirc \times 4 < 8$

Solution set = { ______ }

$\bigcirc + 2 > 5$

Solution set = { ______ }

$\bigcirc + 8 < 11$

Solution set = { ______ }

$\bigcirc \times 2 < 10$

Solution set = { ______ }

$\bigcirc \times 4 > 16$

Solution set = { ______ }

$\bigcirc + 7 < 14$

Solution set = { ______ }

$\bigcirc + 5 < 12$

Solution set = { ______ }

$\bigcirc \times 5 < 20$

Solution set = { ______ }

3.04.08 MULTIPLICATION OF TENS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.08.01A multiply ten by the numbers one (1) through nine (9) using vertical and horizontal formats;

e.g.,

$$\begin{array}{r} 10 \\ \underline{\times\ 1} \\ 10 \end{array} \qquad \begin{array}{r} 10 \\ \underline{\times\ 2} \\ 20 \end{array} \qquad \begin{array}{r} 10 \\ \underline{\times\ 3} \\ 30 \end{array} \qquad \begin{array}{l} 1 \times 10 = 10 \\ 2 \times 10 = 20 \\ 3 \times 10 = 30 \end{array}$$

3.04.08.02A apply the commutative property of multiplication to the ten times table;

e.g.,

$$\begin{array}{rcrcl} 6 & \times & 10 & = & 60 \\ 10 & \times & 6 & = & \square \\ 6 & \times & 10 & = & 10 \times 6 \\ 10 & \times & 6 & = & 6 \times \square \end{array}$$

3.04.08.03B use the distributive property of multiplication over addition to multiply multiples of ten (less than 100) by 2, 3, 4, ..., 9;

e.g.,

$$\begin{aligned} 4 \times 20 &= 4 \times (10 + 10) \\ &= (4 \times 10) + (4 \times 10) \\ &= 40 + 40 \\ &= 80 \end{aligned}$$

3.04.08.04B multiply multiples of ten by numbers 2,3,4...9;

e.g.,

$2 \times 20 = 40$

$$\begin{array}{r} 20 \\ \underline{\times\ 2} \end{array}$$

3.04.08

VOCABULARY

TERMS

commutative
distributive

GETTING STARTED

Prepare flashcards showing repeated addition of 10s.

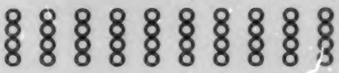
e.g.,

$$\begin{array}{r} 10 \\ \underline{+10} \end{array} \qquad \begin{array}{r} 10 \\ 10 \\ \underline{+10} \end{array} \qquad \begin{array}{r} 10 \\ 10 \\ 10 \\ \underline{+10} \end{array}$$

Show a card to each student and ask him/her to find the sum. Repeat this procedure until each student has had a turn.

Prepare and distribute a large set of discs to each student. Write a number sentence on the chalkboard and ask the students to arrange their discs to show the number sentence.

e.g.,



4 x 10

Repeat this procedure using other number facts for ten.

3.04.08

3.04.08.01 **multiply ten by the numbers one (1) through nine (9) using vertical and horizontal formats**

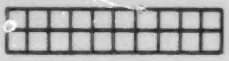
STRATEGY 1: Prepare and distribute ten strips. Ask the students to display 1 ten strip. Say, "How many squares are on this strip? (10) How many strips are there? (1) How many squares in all?" (10) Write the multiplication sentence that describes this strip on the chalkboard.

e.g., 1 x 10 = 10 $\begin{array}{r}10\\ \underline{x1}\end{array}$

Continue this procedure through 9 tens.

STRATEGY 2: Distribute graph paper and crayons to each student. Ask the students to color two rows of ten squares. Say, "How many squares are colored? (20) Can you write a multiplication sentence that describes this picture?" Ask two students to come to the chalkboard and write the sentence vertically and horizontally.

e.g.,



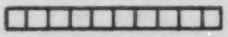
2 x 10 = 20 $\begin{array}{r}10\\ \underline{x2}\\ 20\end{array}$

Continue this procedure for 1 ten through 9 tens.

3.04.08.02 **apply the commutative property of multiplication to the ten times table**

STRATEGY 1: Distribute graph paper and crayons. Say, "Color one row of ten boxes and write the multiplication fact that describes the picture.

e.g.,



1 x 10 = 10

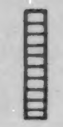
Turn your paper around. How many rows are colored? (10) How many squares in each row are colored? (1) How many squares in all are colored?" (10)

Select a student to write the multiplication fact that describes the picture on the chalkboard.

3.04.08

STRATEGY 1: cont'd

e.g.,



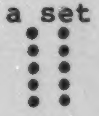
10 x 1 = 10

Say, "How are these examples alike? How are they different? When we change the order of the factors we do not change the product."

Continue this procedure for other facts of ten.

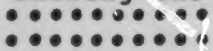
STRATEGY 2: Prepare a set of index cards with an array.

e.g.,



On the reverse side of the index card draw a diagram showing the commutative pair of that fact.

e.g.,



Distribute a card to each student and ask him/her to write the number sentences that match the arrays.

e.g., 2 x 10 = 20 10 x 2 = 20

Ask the students to switch cards and repeat the procedure.

3.04.08.03 **use the distributive property of multiplication over addition to multiply multiples of ten (less than 100) by 2, 3, 4, ...9**

STRATEGY 1: Prepare magnetic discs. Display two groups of 20 magnetic discs. Ask a student to count the discs in each row. Say, "What multiplication sentence describes this array?" (2 x 20) Ask a student to rearrange the discs into groups of ten.

e.g., oooooooooo oooooooooo
oooooooooo oooooooooo

Say, "How many rows do we have? (2) There are two groups of ten in each row. We have rearranged the discs so they show 2 groups of 10 + 10. We can write this as a multiplication sentence." Write the following on the chalkboard.

STRATEGY cont'd

e.g., 2 groups of 10 = 2 groups of 10 + 10
2 x 20 = 2 x (10 + 10)

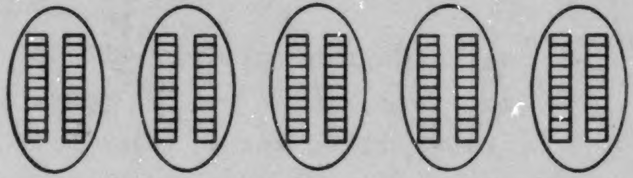
Say, "We now have two multiplication examples, 2x10 + 2x10." Write this on the chalkboard and point to the arrays. Ask two students to solve the equation. Write 20 + 20 = on the chalkboard. Ask a student to perform the addition and write it on the chalkboard.

e.g., 2 groups of 20 = 2 groups of 10 + 10
2 x 20 = 2 x (10 + 10)
= (2x10) + (2x10)
= 20 + 20
= 40

Continue this procedure using other multiples of 10.

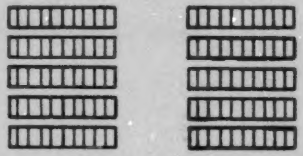
STRATEGY 2: Write the number sentence 5x20 = 100 on the chalkboard. Display the number sentence using ten strips.

e.g.,



Rearrange the squared material to show 5x(10 + 10). Say, "Are these examples the same? Why? (20 = 10 + 10)" Divide the groups so that they show (5x10) + (5x10).

e.g.,



Say, "You can rearrange the squared material but the product does not change." Write the number sentence on the chalkboard.

e.g.,
5 x 20 = 100
5 x (10 + 10) = 100
(5x10) + (5x10) = 100
50 + 50 = 100
100 = 100

Repeat this procedure.

3.04.08

3.04.08.04 **multiply multiples of ten by numbers 2, 3, 4... 9**

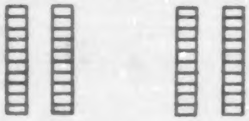
STRATEGY 1: Prepare and distribute ten strips. Write the following examples on the chalkboard.

e.g., $\begin{array}{r}10\\ \underline{\times 2}\end{array}$ $\begin{array}{r}10\\ \underline{\times 3}\end{array}$ $\begin{array}{r}10\\ \underline{\times 4}\end{array}$

Say, "Place two ten strips on your desk. How many squares are there in all?" (20) Continue this procedure with the other examples.

Say, "Make 2 groups of 20."

e.g.,



Say, "How many squares in all? (40) We can write a multiplication sentence for this arrangement." Write 2 x 20 = 40 and $\begin{array}{r}20\\ \underline{\times 2}\\ 40\end{array}$.

Say, "We can multiply without using squared material. Look at $\begin{array}{r}20\\ \underline{\times 2}\end{array}$. What is the product of any number times zero? (0) Place a zero in the ones place. 2 x 2 equals four; our answer is 40."

Continue this procedure.

STRATEGY 2: Write the following examples on the chalkboard.

e.g., $\begin{array}{r}20\\ \underline{\times 2}\end{array}$ $\begin{array}{r}30\\ \underline{\times 4}\end{array}$ $\begin{array}{r}40\\ \underline{\times 2}\end{array}$

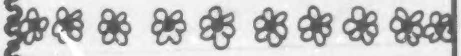
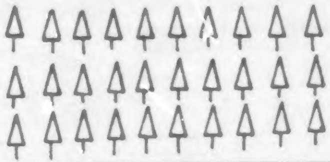
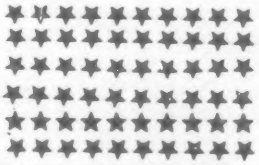
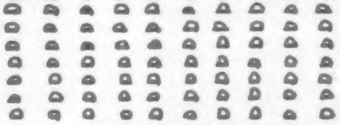
Point to the first example. Say, "How much is 2 x 0? (0) How much is 2 x 2? (4) You multiply 2 times 2 and write the zero." Write $\begin{array}{r}20\\ \underline{\times 2}\\ 40\end{array}$ and 2 x 20 = 40.

Continue this procedure using other numbers.

P.O. 3.04.08.01

NAME: ________________________ CLASS: __________ DATE: ________

Complete the chart.

	$1 \times 10 = 10$	$\begin{array}{r}10\\ \times 1\\ \hline 10\end{array}$
	$2 \times 10 = 20$	
		
		$\begin{array}{r}10\\ \times 4\\ \hline 40\end{array}$
	$5 \times 10 = 50$	
		
		$\begin{array}{r}10\\ \times 7\\ \hline 70\end{array}$
		
	$9 \times 10 = 90$	

P.O. 3.04.08.02

NAME: ____________________ CLASS: __________ DATE: ________

1. Fill in the box.
2 & 3. Fill in the box and match.
4. Draw an array to show: 8 x 10; 10 x 8

1

3 × ☐ = 30

☐ × 3 = 30

☐ × 10 = 50

10 × ☐ = 50

6 × 10 = ☐

☐ × 10 = 60

2

2 × ☐ = 20

3 × ☐ = 30

4 × ☐ = 40

5 × ☐ = 50

6 × ☐ = 60

3

10 × ☐ = 60

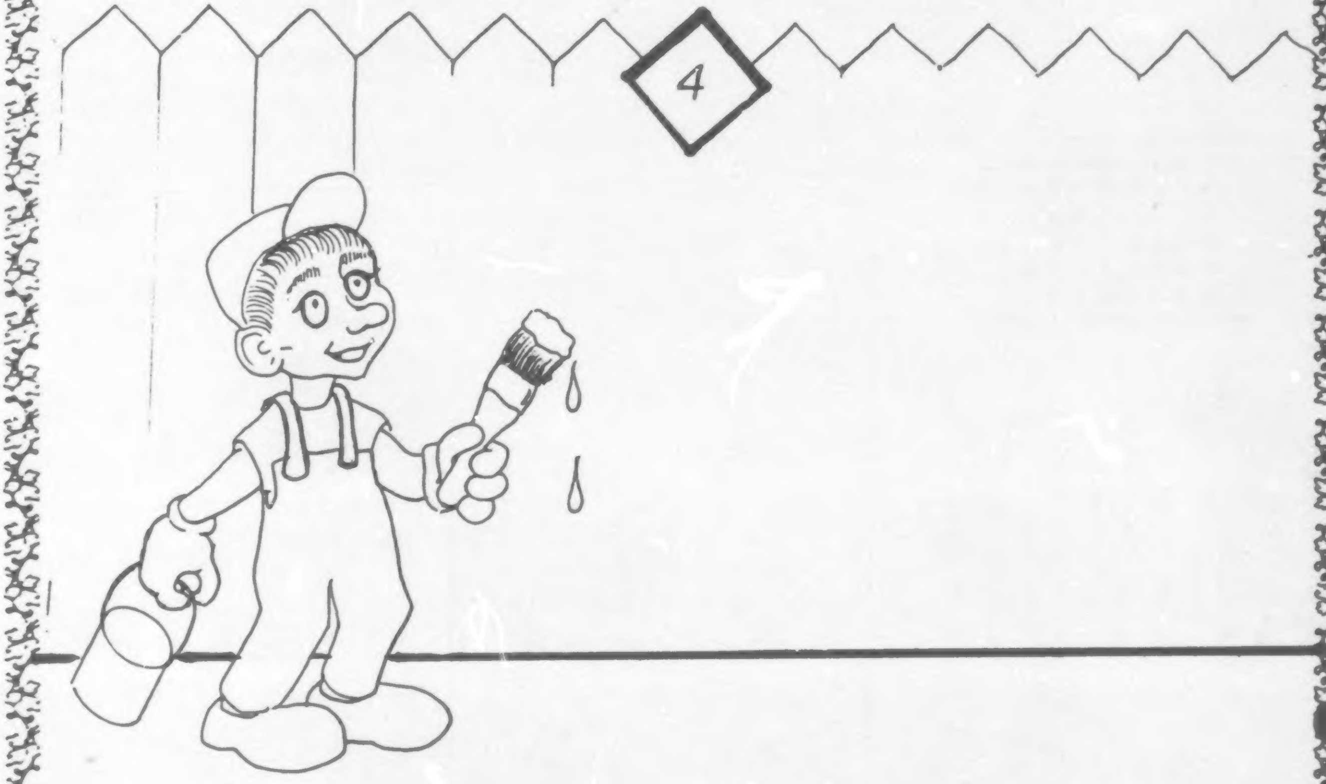
10 × ☐ = 40

10 × ☐ = 20

10 × ☐ = 30

10 × ☐ = 50

4



P.O. 3.04.08.03

NAME: ______________________________ CLASS: __________ DATE: __________

Redistribute the number sentences as shown.

6 x 20 = 5 x (10 + 10)

(6 x 10)+(6 x 10)

60+ 60 = 120

5 x 10 =

3 x 30

2 x 40

4 x 50

7 x 40

P.O. 3.04.08.04

NAME:____________________ CLASS:________ DATE:________

Solve the examples and use the key to break the code.

a 40 X 2 80	b 2 X 20 =	c 50 X 2
d 40 X 3	e 20 X 2	f 70 X 2
g 2 X 60 =	h 30 X 3	i 3 X 20 =

F	__	__	__	__	__	__	__	__
a	b	c	d	e	f	g	h	i

Key

A = 40 F = 80 N = 100 T = 120

C = 60 I = 90 S = 140

3.04.09 PATTERNS IN MULTIPLICATION TABLES THROUGH 10 x 10

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.09.01A fill in a multiplication table from zero through 10 zeros to ten through 10 tens; e.g.,

X	0	1	2	3	4	5	6	7	8	9	10
1	0	1	2	3	4	5	6	7	8	9	10
2											
3											
4											
5											
6											
7											
8											
9											
10											

3.04.09.02A find patterns in multiplication tables from zero through 10 zeros to ten through 10 tens. e.g.,

X	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

3.04.09

VOCABULARY

TERMS

multiplication table
pattern

GETTING STARTED

Write the following sequence of numbers on the chalkboard.

e.g., 0, 3, 6, _9_ 12, _15_, 18, 21, _24_....

Say, "Look at the numbers 0, 3, 6. Use these numbers to figure out which number belongs between the 6 and the 12." Ask a student to come to the chalkboard to fill in the numbers and explain to the class the pattern that he/she discovered. Ask the students to copy the sequence into their notebooks. Repeat this procedure using other number patterns.

Ask the students to stand at their seats. Play the game "Multiplication Bee" with the class. Prepare multiplication flashcards and hold up one card, e.g., 3 x 5 = . Ask a student to respond. If the response is correct, he/she remains standing. If the response is incorrect, he/she must sit down. Continue playing the game until one student is left standing. That student is declared the winner.

3.04.09

3.04.09.01 **fill in a multiplication table from zero through 10 zeros to ten through 10 tens**

STRATEGY 1: Write the following multiplication table on the chalkboard.

	X	0	1	2	3	4	5	6	7	8	9	10
1	0											
2												
3												
4												
5												
6												
7												
8												
9												
10												

Distribute a copy of the table to each student. Say, "Look at the first number under the multiplication symbol. Multiply this number by each of the numbers on top. Place each product under the number by which you multiplied. How much is one times zero?" (zero) Write zero in the correct place. Say, "How much is one times two?" Repeat this procedure until the first line is completed. Repeat this procedure for the second line (the two times table). Ask the students to fill in the rest of the table by themselves using the same format.

STRATEGY 2: Prepare and distribute a multiplication table with some of the numbers missing.

X	0	1	2	3	4	5	6	7	8	9	10
1	0	1	☐	3	4	5	6	7	☐	9	10
2	0	2	④	6	☐	10	12	☐	16	18	20
3	0	3	6	☐	12	15	☐	21	24	27	☐
4	0	4	☐	12	☐	20	24	☐	32	☐	40

Say, "If you multiply the number on the side by the number on the top, you place the answer under the number you multiplied by, e.g., 2x2 = 4." Show the students this example on the large multiplication table on the chalkboard. Complete the table by eliminating the missing facts. Ask several students to come to the chalkboard to complete the table.

3.04.09

3.04.09.02 **find patterns in multiplication tables from zero through 10 zeros to ten through 10 tens**

STRATEGY 1: Prepare and display a large multiplication table on the chalkboard. Distribute a copy of the table to each student. Circle the following groups of numbers. e.g.,

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	10
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Say, "Look at the numbers circled on the chalkboard. Why are they circled? These numbers are special because they follow a certain pattern. How much is added to zero to get two?" (two) Write two on the chalkboard. Say, "What can be added to the two to get six?" (four) Write four on the chalkboard. Say, "What can be added to six to get twelve?" (six) Write six on the chalkboard. Repeat this procedure until students can identify the pattern existing in this set of numbers. Say, "There are other patterns in this table. See how many you can find. Circle the patterns."

STRATEGY 2: Write an incomplete sequence of numbers on the chalkboard. Elicit the pattern existing in the group of numbers. Ask one student to complete the sequence on the chalkboard. Say, "Look for the same patterns on your multiplication tables. Circle the pattern when you find it." Repeat this procedure using other examples of number patterns.

P.O. 3.04.09.01 -.02

NAME:______________________________ CLASS:__________ DATE:________

Complete the multiplication table .
Find three patterns.

X	0	1	2	3	4	5	6	7	8	9	10
0	0										0
1		1								9	
2			4						16		
3				9				21			
4					16		24				
5						25					
6					24		36				
7				21				49			
8			16						64		
9		9								81	
10	0										100

COMPLETE THE MULTIPLICATION TABLE.

X X FIND THREE PATTERNS X X

3.12.02 PROBABILITY

(3 lessons)

PERFORMANCE OBJECTIVES

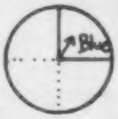
The student will be able to...

3.12.02.01A compare results with predictions; e.g.,

> Predict the number of heads that will turn up if you flip a coin 100 times.

3.12.02.02A predict the outcome of unequally likely events. e.g.,

> How many times will blue come up?



3.12.02

VOCABULARY

TERMS

predict
prediction

GETTING STARTED

Divide the class into groups of two. Distribute one coin and a sheet of paper to each group. Ask the students to write the headings, Heads and Tails on the paper and number it from one (1) through thirty-five (35). Say, "You will be taking turns tossing the coin. Record your results on the paper."

e.g.,

	Heads	Tails
1		
2		
3		
4		
5		
6		

At the completion of the trials, ask the students to count the number of checks in each column. Instruct students to write the number at the top of each column. Discuss and compare their results using data from all groups.

Place six different color marbles in a paper bag. Write the colors on the chalkboard. Say, "You will be taking turns to choose a marble from the bag." Ask a student to put his/her hand in the bag and randomly choose one marble. Ask the student to show the rest of the class the color. Record the choice on the chalkboard. Replace the marble in the bag. Repeat this activity until all students have had a turn at choosing a marble. After the chart has been completed say, "Which color marble was chosen most often? least? Are there any two colors that were picked the same number of times?"

e.g.,

Red	Blue	White	Yellow	Black	Green
~~1111~~ 11	~~1111~~ 1	1111	111	~~1111~~ 11	~~1111~~ 111

3.12.02

3.12.02.01 **compare results with predictions**

STRATEGY 1: Prepare slips of paper with the students' names written on each. Place the slips in a box. Ask the students to number a paper from 1 through 25. Say, "I am going to pick a piece of paper out of the box. A student's name is written on the paper. Can you predict whose name I will pick?" Ask the students to write their predictions next to number one on their papers. Draw a slip of paper from the box. Read the name. Ask the students who predicted the outcome correctly to raise their hands. Return the paper to the box. Ask a student to draw the next paper. Continue this procedure through twenty-five trials. Say, "Did you always guess right? Can we be sure, in advance, what the result of any one drawing can be?"

STRATEGY 2: Prepare a die. Write the numbers one through six on the chalkboard. Ask a student to circle the even numbers and underline the odd numbers. Say, "Each of the numbers 1 through 6 is represented by dots." Write the words even and odd on the chalkboard. Say, "I am going to roll the die. Your job is to predict whether the number rolled will be odd or even. Write your predictions on a piece of paper." Ask a student to keep a tally of the outcomes on the chalkboard. At the completion of 25 rolls, ask the students the following questions, "Which type of numbers were rolled most often? Is it possible for a number not to be rolled at all?"

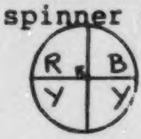
3.12.02

3.12.02.02 **predict the outcome of unequally likely events**

STRATEGY 1: Place 20 blue crayons and 10 red crayons in a large container. Ask the students to predict which color crayon is most likely to be picked, if one is chosen without looking. Pick one crayon from the container and compare the outcome with the students' prediction. Say, "Number a sheet of paper from 1 through 30." Ask a student to draw out crayons one at a time and show the color of the crayon to the students before replacing it. Say, "Before John picks a crayon, write the color next to the corresponding number. If your prediction is correct, place a check next to it." Continue this procedure until 30 draws have been made. Say, "A blue crayon was drawn more times because there were more blue crayons than red crayons in the container." Repeat this procedure.

STRATEGY 2: Make a spinner out of cardboard. Divide the spinner into four equal parts. Designate each part of the spinner with a color.

e.g.,



Ask the students to write the colors of the spinner on a piece of paper. Say, "We will spin the spinner 10 times. Of those ten times predict the number of times each color will come up. Write your predictions under each color." Draw the following table on the chalkboard.

Spin #1 - yellow
Spin #2 -
Spin #3 -

Spin the spinner and record the outcome. Repeat for ten spins. Say, "Which color came up most often? Why?" (Yellow had more space on the spinner.) Repeat this procedure using other spinners.

P.O. 3.12.02.01

NAME: ______________________ CLASS: __________ DATE: ________

Predict how many times heads or tails would come up if you tossed the coin 5 times.

HEADS ? TAILS

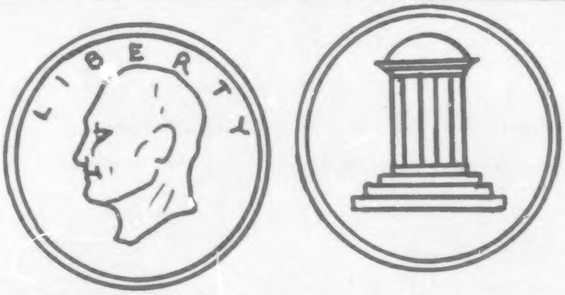
1		
2		
3		
4		
5		

?

PREDICTION

?

Now toss the coin 5 times. Record your results.



HEADS TAILS

1		
2		
3		
4		
5		

RESULTS

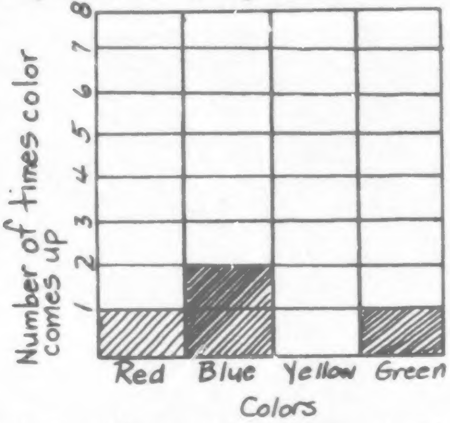
HOW CLOSE WAS YOUR PREDICTION?

P.O.3.12.02.02

NAME:______________________________ CLASS:__________ DATE:________

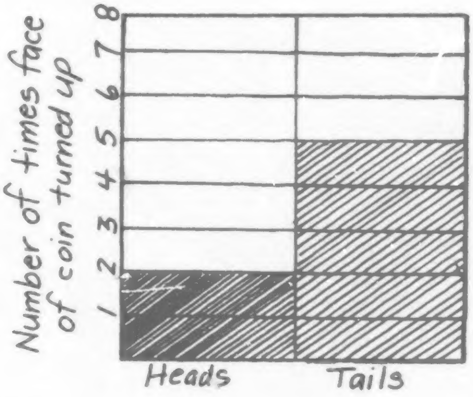
Guess the outcome of each event.

John and Mary are spinning a spinner with four colors. The spinner is divided into 5 parts. There are 2 blue sections and a section each of the other colors. John is making a graph to show how many times each color comes up. This is John's graph after 4 spins.



Which color will come up the most times after 10 spins? __________

Tom is tossing a coin. To keep track of the number of times each side of thecoin turns up, Tom is making a graph. This is Tom's graph after tossing the coin 7 times.



Will more heads or tails turn up after 15 tosses? __________

Sue and Jane are drawing different color blocks from a bag. There are 2 red blocks, 4 blue blocks, 1 yellow block and 1 black block in the bag. Jane is keeping a tally of the number of times each color block is drawn from the bag. This is Jane's tally after 8 drawings.

<table>
<tr><th>Red</th><th>Blue</th><th>Yellow</th><th>Black</th></tr>
<tr><td>||</td><td>||||</td><td></td><td>||</td></tr>
</table>

Which color block will be drawn from the bag most after 20 times?______

Mike is drawing marbles of different colors from a bag. There are 2 marbles of black and white and 1 marble of green. The marble is returned to the bag after each drawing Mike is keeping a tally of the number of times that each color marble is drawn. His tally after 10 drawings is

<table>
<tr><th>Black</th><th>Green</th><th>White</th><th>Yellow</th></tr>
<tr><td>||||</td><td>|</td><td>|||</td><td>||</td></tr>
</table>

After 25 drawings, which color marble will be drawn the most times?_______

Unit 46

3.12.03 ARRANGEMENTS - TREE DIAGRAMS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.12.03.01A list and count the number of possible arrangements in a set of objects; e.g.,

WET

WET
WTE
TWE
TEW
ETW
EWT

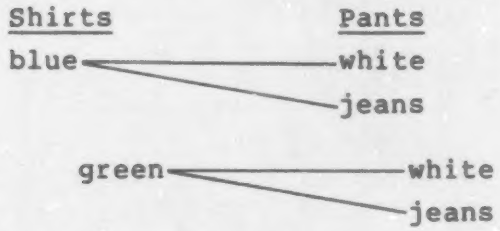
(□, ○, △)

1. □,○,△
2. □,△,○
3. △,○,□
4. △,□,○
5. ○,□,△
6. ○,△,□

3.12.03.02A make a tree diagram to display combinations of given data. e.g.,

Data: blue shirt, green shirt,
jeans, white pants.

How many outfits can you make?


Shirts
Pants
blue
white
jeans
green
white
jeans

3.12.03

VOCABULARY

TERMS

arrangements
tree diagram
data
combinations

GETTING STARTED

Play the following word game with the students. Write a multisyllable word on the chalkboard, e.g., alphabet. Say, "Using the letters in this word, write as many new words as you can. You may not use a letter more than once in your word if the letter appears only once, e.g., you may make the word heal but not heel."

Repeat this procedure using other multisyllable words.

Ask the students the names of their favorite colors. Make a bar graph on the chalkboard with the data that the students give. At the same time, ask each student to make his/her own bar graph on a piece of notebook paper. Discuss the data on the bar graph by asking questions, e.g., "Which color is least popular? How many more students like green than purple?"

3.12.03

3.12.03.01 **list and count the number of possible arrangements in a set of objects**

STRATEGY 1: Ask three students to come to the front of the classroom. Write their names on the chalkboard. Say, "At the front of the room you see Jose first, Kathy second and Thomas third. Let's see how many different ways they can stand." Each time they change places write the new order on the chalkboard and say, "Have they stood this way before?" If there is a repeat, erase that order from the chalkboard. Repeat this procedure until all combinations have been used. Ask the students to count the number of possible arrangements. Repeat this procedure using other numbers of students.

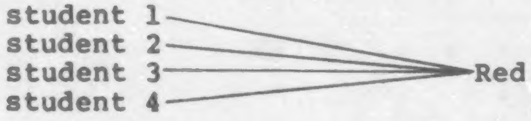
STRATEGY 2: Distribute three different color crayons to each student. Say, "You are going to arrange these crayons in different orders. Each time you arrange the crayons differently, write the order on a piece of notebook paper. See how many different arrangements you can make. When you are finished, count the number of arrangements you have made." Ask several students to write their combinations on the chalkboard. Each time a student writes his/her combination say, "Has this combination ever been used before?" When all the possibilities have been written, ask one student to count the combinations. Repeat this procedure using other objects.

3.12.03

3.12.03.02 **make a tree diagram to display combinations of given data**

STRATEGY 1: Say, "We made a bar graph to show the favorite colors of the students in the class. There is another way to show what colors the students like." Draw the following on the chalkboard using the information from the bar graph for the first color.

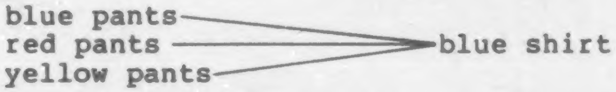
e.g.,



Ask the students to come to the chalkboard to draw diagrams for the other favorite colors. Say, "Pretend that you have the following: blue pants, red pants, yellow pants, a blue shirt and a white shirt. We are going to make a diagram to show the different ways you can wear the pants and shirts. We call the clothing, the data."

Draw the following on the chalkboard.

e.g.,



Say, "How many different pair of pants can you wear with the blue shirt?" Elicit the following tree diagram from the students.

Repeat this procedure for the white shirt. Repeat this procedure using other data.

STRATEGY 2: Write the following problem on the chalkboard.

Mary has a blue skirt and a red skirt. She has three blouses, a white one, a pink one and a yellow one. How many different ways can she wear her clothes?

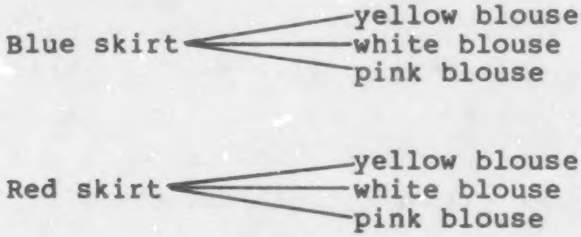
Say, "How many different outfits can she make with the blue skirt? with the red skirt?" Write the following on the chalkboard.

e.g.,

blue skirt   red skirt

Ask the students to come to the chalkboard to write the blouses under the skirts. Say, "We can draw a picture to show what Mary wears." Elicit the following diagram from the students.

e.g.,


Blue skirt
yellow blouse
white blouse
pink blouse
Red skirt
yellow blouse
white blouse
pink blouse

Say, "This is a tree diagram. We use this to display combinations when we are given the data."

Repeat this procedure using other data.

P.O. 3.12.03.01

NAME:______________________________ CLASS:________ DATE:________

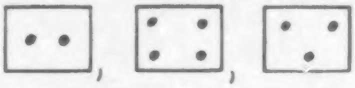
List and count the numbers of possible arrangements in each set. The first one has been done for you.

1. □, ○, △

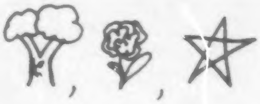
1. □, ○, △
2. □, △, ○
3. △, ○, □
4. △, □, ○
5. ○, □, △
6. ○, △, □

2. T, W, O

3.

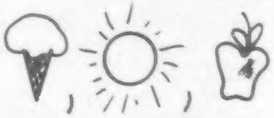


4.



5. S, A, W

6.



P.O. 3.12.03.02

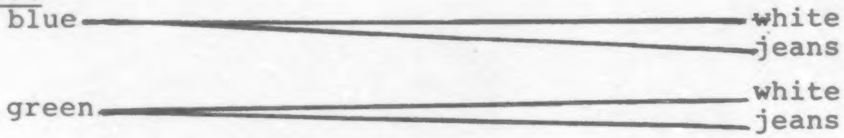
NAME: ______________________ CLASS: __________ DATE: ________

Use the data given to make a tree diagram. The first one is done for you.

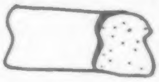
1) Data: blue shirt, green shirt, jeans, white pants

Shirt

Pants



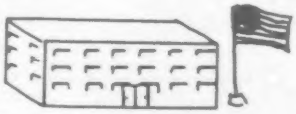
2) Data: tuna fish, salami, turkey white bread, whole wheat bread



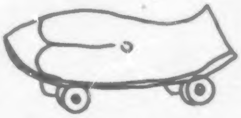
Bread

Filling

3) Data: going home, going to school roller skates, bicycle, skateboard



Destination



Transportation

3.04.10 MULTIPLICATION OF 2- AND 3-DIGIT NUMBERS BY NUMBERS LESS THAN 10 WITHOUT REGROUPING (EXCHANGE)

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.10.01A multiply 100 and its multiples by a 1-digit number;
e.g.,

$$5 \times 100 = 500$$

3.04.10.02A multiply 2- and 3-digit numbers by numbers less than 10 in vertical and horizontal formats without regrouping (exchange);
e.g.,

$$\begin{array}{r} 42 \\ \underline{\times 2} \\ 84 \end{array} \qquad 2 \times 42 = 84$$

3.04.10.03A solve word problems related to skills learned in this module.
e.g.,

There were 3 boxes of marbles on a desk. Each box contains 32 marbles. How many marbles are there in all?

$$\begin{array}{r} 32 \\ \underline{\times 3} \\ 96 \end{array} \text{ marbles}$$

3.04.10

VOCABULARY

TERMS	SYMBOLS
vertical	
horizontal	
multiply	x

GETTING STARTED

Prepare flashcards with basic multiplication facts on them. Distribute twelve (12) chips to each student. Write 2 x☐ = 12 on the chalkboard . Say, "Each box represents a missing factor." Read the number sentence as two groups of how many equal 12? Say, "We want to find how many chips are in each group. Place your chips into two equal piles, one at a time until there are no chips left. How many chips do you have in each pile?" (6) Ask one student to fill in the box. Repeat this procedure using various multiplication sentences.

Prepare flashcards with basic multiplication and division facts on each card.

e.g.,

3 x 4 =

12 ÷ 4 =

Divide the class into two teams. Play "Math baseball." Show the first student on team A a card. If he/she answers correctly, he/she goes to first base. If the student misses, the team gets an out. team A continues until there are three outs. Then team B has its chance. The team with the most points after nine innings wins.

3.04.10

3.04.10.01 multiply 100 and its multiples by a 1-digit number

STRATEGY 1: Prepare and distribute hundreds cards to groups of students. Ask three students to perform the following examples at the chalkboard.

e.g.,

$$\begin{array}{r} 30 \\ \underline{x3} \end{array} \qquad \begin{array}{r} 10 \\ \underline{x7} \end{array} \qquad \begin{array}{r} 40 \\ \underline{x2} \end{array}$$

Say, "What patterns do you see in these examples? (same number of zeros in the product as in one of the factors) Make one group of 200 using your cards. How many hundreds do we have?" (2) Ask a student to write this arrangement as a multiplication example.

e.g.,

$1 \times 200 = 200$

Say, "Make three groups of 200. How many hundreds in all?" (600) Write $3 \times 200 = 600$. Say, "What pattern is emerging?" (When we multiply hundreds, multiply the hundreds column and add two zeros.)

Continue this procedure using other numbers.

STRATEGY 2: Write the ten times table on the chalkboard. Say, "What is a rule for multiplying by 10?" (When you multiply by ten or its multiples, you multiply the tens column and add a zero.) Write the following examples on the chalkboard.

e.g.,

$$\begin{array}{r} 10 \\ \underline{x5} \end{array} \qquad \begin{array}{r} 100 \\ \underline{x5} \end{array}$$

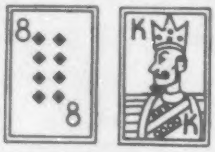
Say, "We know the rule for multiplying by ten. Is there a rule for multiplying by 100?" (The rule is the same, but instead of adding one zero, we add two zeros.)

Prepare a deck of playing cards and separate the Jacks, Queens and Kings into one pile and all of the numbered cards into another. Say, "Jack = 1, Queen = 10, King = 100." Ask a student to draw a card from each pile. Ask the student to read his

STRATEGY 2: cont'd

card and ask the class to construct a problem.

e.g.,



= 8 x 100 or 100 x 8 = 800

Repeat this procedure by asking other students to pick cards.

3.04.10.02 **multiply 2- and 3-digit numbers by numbers less than 10 in vertical and horizontal formats without regrouping (exchange)**

STRATEGY 1: Prepare and distribute squared material. Say, "Use the material and show 42. How did you show 42? (4 tens and 2 ones) Make another group of 42. How many ten strips in all? (8) How many unit pieces in all? (4) We can write a multiplication example about the squared material. Write the following on the chalkboard.

e.g.,

$$2 \times 42 = 84 \qquad \begin{array}{r} 42 \\ \underline{\times 2} \\ 84 \end{array}$$

Say, "Point to each group as I point to the example. How much are two groups of 2? (4) How much are two groups of 40? (80) First we multiply the ones and then we multiply the tens."

Continue this procedure.

STRATEGY 2: Draw a place value chart on the chalkboard. Write the following example on the chalkboard in the chart.

e.g.,

Hundreds	Tens	Ones
	4	0
	x	2

Say, "First we multiply the ones. How much are two groups of 2? (4) Next we multiply the tens. How much are two groups of 40?" (80) Write the product in the example.

STRATEGY 2: cont'd

e.g.,

Hundreds	Tens	Ones
	4	0
	x	2
	8	0

Continue this procedure using other examples, presenting the examples both vertically and horizontally.

3.04.10.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

There are 14 marbles in each cup. There are 2 cups. How many marbles in all?

Say, "What operation will we use to solve this problem?" (multiplication) There are two ways of writing this number sentence.

e.g.,

14 x 2 = ☐

$$\begin{array}{r} 14 \\ \underline{\times 2} \end{array}$$

Ask a student to come to the chalkboard and solve the problem.

Repeat this procedure using other word problems.

STRATEGY 2: Write word problems for the class on a set of index cards. Pass them out to several students. Ask a student to read the word problem, then come to the chalkboard and write both a horizontal and vertical algorithm.

e.g.,

There are 24 quarts of milk in a case. There are 2 cases. How many quarts of milk are there in total?

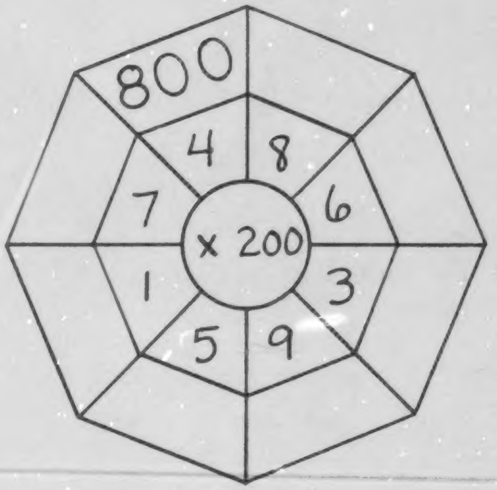
$$\begin{array}{r} 24 \\ \underline{\times 2} \\ 48 \end{array}$$

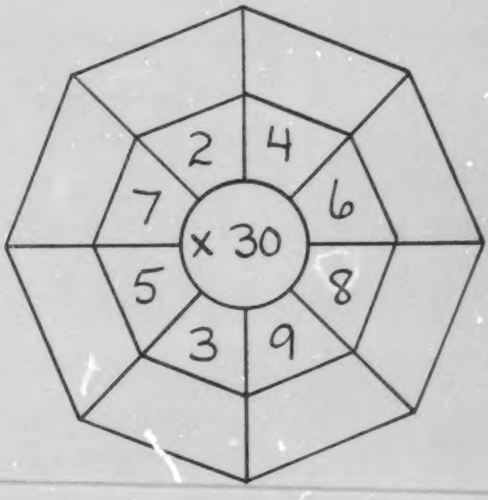
24 x 2 = 48

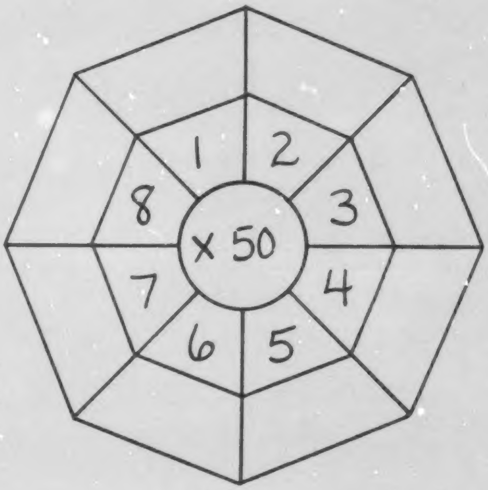
P.O. 3.04.10.01

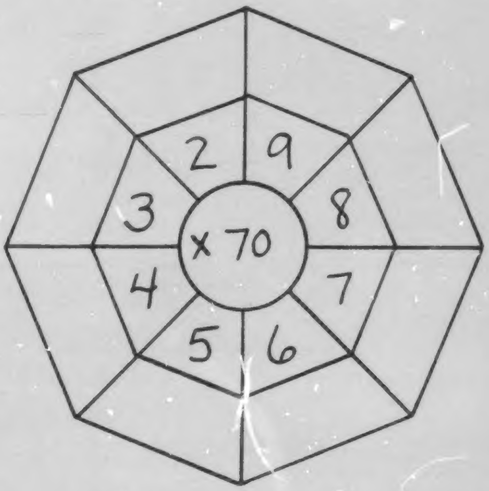
NAME: ______________________ CLASS: __________ DATE: __________

Fill in the missing boxes.
The center circle tells you the multiplier.


800
4
8
7
x 200
6
1
3
5
9


2
4
7
x 30
6
5
8
3
9


1
2
8
x 50
3
7
4
6
5


2
9
3
x 70
8
4
7
5
6

P.O. 3.04,10.02

NAME: ______________________ CLASS: __________ DATE: ________

Multiply.
Use the key to break the code.

42 X 2 48 y	34 X 2 =	423 X 2
121 X 4 =	14 X 2	242 X 2 =
	33 X 3	

34 X 2	28 X 1	312 X 3	32 X 2

111 X 6	68 X 1	424 X 2

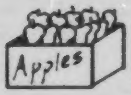
Key

A = 39
B = 848
D = 484
E = 64
F = 68
I = 28
J = 666
N = 936
O = 68
U = 846
Y = 48

P.O. 3.04.10.03

NAME: ______________________ CLASS: ________ DATE: ________

Solve each problem using both a horizontal and vertical number sentence.

	Work Space
There are 12 chairs in each row. If there are 4 rows, how many chairs will we need?	12 × 4 = 48 $\begin{array}{r} 12 \\ \times\ 4 \\ \hline 48 \end{array}$
There are 14 apples in each crate. If there are 2 crates, how many apples are there? 	
There are 13 fish in each tank. If there are 3 tanks, how many fish are there altogether?	
If there are 11 people at each of 4 bus stops, how many people are there altogether?	
If there are 12 joggers on each team and there are 3 teams, how many joggers are there?	

Unit 48

3.05.06 ESTIMATION IN DIVISION

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.06.01A name the dividend, the divisor and the quotient in a given example;
e.g.,

$$\begin{array}{lrl} & 7 & \text{quotient} \\ \text{(divisor)} & 4\overline{)28} & \text{dividend} \end{array}$$

3.05.06.02B estimate the quotient in a division example.
e.g.,

$$6\overline{)366}$$

$1 \times 6 = 6$

$10 \times 6 = 60$

$$\boxed{\begin{array}{rcrcl} 100 \times 6 & = & 600 & > & 366 \\ 20 \times 6 & = & 120 & < & 366 \\ 30 \times 6 & = & 180 & < & 366 \\ 40 \times 6 & = & 240 & < & 366 \\ 50 \times 6 & = & 300 & < & 366 \\ 60 \times 6 & = & 360 & < & 366 \\ 70 \times 6 & = & 420 & > & 366 \end{array}}$$

3.05.06

VOCABULARY

TERMS

dividend
divisor
quotient
estimate

GETTING STARTED

Play "Division Bee" using flashcards of division facts. Divide the class into two teams. Each student should have a chance to see a flashcard with a division fact, e.g., $9\overline{)45}$. If he/she cannot give the correct answer, a student on the other team should have a turn. Each time a correct answer is given, that team gets a point. The team with the most points wins.

Play "Division Bingo". Ask the students to divide a piece of paper into sixteen boxes and write one number between 0 and 9 in each box. Numbers may be repeated as often as the student chooses. Prepare and use division flashcards, one at a time. If student has the quotient on his/her paper, he/she may cover the number once. When a student has four numbers covered horizontally, diagonally, or vertically, he/she calls "Bingo." Prizes or points may be used for the winners.

3.05.06

3.05.06.01 **name the dividend, the divisor and the quotient in a given example**

STRATEGY 1: Write the following example on the chalkboard.

e.g.,

$$\begin{array}{r}7\\4\overline{)28}\end{array}$$

Say, "There are several words to name the parts of a division example." Point to each part as you refer to it. Say, "The number you are dividing is called the dividend. The number you are dividing by is called the divisor. The number that is the result of the division operation or the answer is called the quotient." Ask several students to come to the chalkboard and label the divisor, the dividend and the quotient. Repeat this procedure using the following examples.

e.g.,

$$24 \div 6 = 4, \quad \begin{array}{r}6\\3\overline{)18}\end{array}, \quad 49 \div 7 = 7$$

STRATEGY 2: Write the following on the chalkboard.

e.g.,

$$\begin{array}{r}8\\6\overline{)48}\end{array} \quad 48 \div 6 = 8$$

Say, "48 is the dividend, 6 is the divisor, 8 is the quotient."

Prepare flash cards. Have the students identify each part that is circled.

e.g.,

$$\begin{array}{r}9\\6\overline{)\enclose{circle}{54}}\end{array} \quad \text{dividend}$$

3.05.06

3.05.06.02 estimate the quotient in a division example

STRATEGY 1: Write $6\overline{)366}$ on the chalkboard. Say, "We will use a Think Box to help us estimate the quotient in a division example." Write Think Box on the chalkboard. Say, "How much is 1x6? (6) Six is less than 366, so we go to 10x6. Sixty is less than 366, so we go to 100x6." Write on the chalkboard.

e.g.,

$1 \times 6 = 6 \quad 6 < 366$
$10 \times 6 = 60 \quad 60 < 366$
$100 \times 6 = 600 \quad 600 > 366$

Say, "Now we know our quotient will be between 10 and 100."

Continue with the Think Box in this manner.

e.g.,

$6\overline{)366}$

$20 \times 6 = 120 \quad 120 < 366$
$30 \times 6 = 180 \quad 180 < 366$
$40 \times 6 = 240 \quad 240 < 366$
$50 \times 6 = 300 \quad 300 < 366$
$60 \times 6 = 360 \quad 360 < 366$
$70 \times 6 = 420 \quad 420 > 366$

Say, "The quotient is estimated at 60 because 60 times 6 is 360 which is less than 366, while 70 times 6 is greater than 366."

Repeat this procedure using other examples.

STRATEGY 2: Write the following example on the chalkboard, e.g., $6\overline{)341}$. Say, "To estimate the quotient in a division example round the dividend to the nearest ten (340) and drop the zero. Is 34 in the six times table? (34 is not in the six times table and the closest number is 30.) How many sixes are in 30? (5) If there are 5 sixes in 30, how many sixes will be in 300?" (50) Repeat this procedure using other examples.

P.O. 3.05.06.01

NAME:____________________________________CLASS:________DATE:_______

Put a circle around the dividend (○). Put a box around the devisor (□). Put a triangle around the quotient (△).

Example $\begin{array}{r} \triangle\,7 \\ \boxed{6}\overline{)\textcircled{42}} \end{array}$	$36 \div 6 = 6$
$\begin{array}{r} 6 \\ 9\overline{)54} \end{array}$	$\frac{35}{7} = 5$
$18 \div 6 = 3$	$\frac{21}{7} = 3$
$81 \div 9 = 9$	$\frac{7}{7} = 1$
$\begin{array}{r} 8 \\ 8\overline{)64} \end{array}$	$\begin{array}{r} 4 \\ 5\overline{)20} \end{array}$

P.O. 3.05.06.02-03

NAME: ____________________ CLASS: ________ DATE: ________

Estimate the number of places in the quotient. Then estimate the quotient.

$2\overline{)128}$

Number of places ______

☐ Think Box

$4\overline{)268}$

Number of places ______

☐ Think Box

$9\overline{)225}$

Number of places ______

☐ Think Box

Unit 49

3.05.07 DIVISION OF A 2- AND 3-DIGIT DIVIDEND BY A 1-DIGIT DIVISOR

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.07.01B divide a number through 99 by a 1-digit divisor without a remainder;
e.g.,

$$4\overline{)84}$$

3.05.07.02B divide a number through 999 by a 1-digit divisor without a remainder;
e.g.,

$$3\overline{)366}$$

3.05.07.03B solve word problems related to skills learned in this module.
e.g.,

Crayons come in a large box with 244 in it. Alex has to divide the box equally between 2 of his classmates. How many crayons will each student get?

$$\begin{array}{r} 122 \\ 2\overline{)244} \end{array} \text{ crayons}$$

GETTING STARTED

Write the following on the chalkboard.

Ones	Tens	Hundreds
2		200
	40	

Ask the students to count by ones to ten, tens to one hundred, and hundreds to one thousand.

Ask a student to fill in the first missing number in column one (1). Repeat this procedure until the chart is completed.

Prepare and distribute graph paper to each student. Ask the students to label the paper, e.g.,

X	1	2	3	4	5	6	7	8	9
1									
2									
3									
4									
5									
6									
7									
8									
9									

Ask the students to fill in each box by multiplying the factors and writing the product.

e.g.,

X	1	2	3	4	5	
1	1	2	3	4	5	
2	2	4	6	8	10	
3	3	6	9	12	15	
4	4	8	12	16	20	
5	5	10	15	20	25	

3.05.07

3.05.07.01 **divide a number through 99 by a 1-digit divisor without a remainder**

STRATEGY 1: Say, "Division is a short way to subtract." Write the following example on the chalkboard.

e.g.,

$$\begin{array}{rl} 2\overline{)14} & \\ \underline{-2} & \text{1 two} \\ 12 & \\ \underline{-2} & \text{1 two} \\ 10 & \\ \underline{-2} & \text{1 two} \\ 8 & \\ \underline{-2} & \text{1 two} \\ 6 & \\ \underline{-2} & \text{1 two} \\ 4 & \\ \underline{-2} & \text{1 two} \\ 2 & \\ \underline{-2} & \text{1 two} \\ 0 & \end{array}$$

Say, "How many twos did we take from 14? (7) 14 ÷ 2 = 7. We can solve all division examples by using repeated subtraction." Write the following example on the chalkboard, $7\overline{)77}$. Say, "We can subtract 7 repeatedly until we find out how many 7's there are in 77. There is a faster way to solve this problem. We can subtract groups of 7 rather than one 7 at a time."

e.g.,

$$\begin{array}{rl} 11 & \\ 7\overline{)77} & \\ \underline{21} & \text{3 sevens} \\ 56 & \text{8 sevens} \\ \underline{56} & \end{array}$$

Say, "The quotient tells us how many sevens are in seven tens and how many sevens are in seven. We can use this information to divide in a short way." Write the following example on the chalkboard, e.g., $4\overline{)48}$. Say, "How many 4's are in 4 tens? (10) How many 4's are in 8 ones?" (2) Repeat this procedure using other examples.

3.05.07

STRATEGY 2: Prepare and distribute squared material. Say, "Place 8 ten strips and 4 unit pieces on your desk. Separate the material into four equal groups. How many ten strips are in each group? (2) How many unit pieces are in each group? (1) We separated 84 into four equal groups, how much is represented in each group? (21) We divided the 84 into four equal groups. We can write this arrangement as a division example." Write on the chalkboard.

e.g.,

$$\begin{array}{r} 21 \\ 4\overline{)\,84} \end{array} \qquad 84 \div 4 = 21$$

Say, "We divided 4 into 80 and 4 into 4 and our answer was 21."

Repeat this procedure using other examples.

3.05.07.02 **divide a number through 999 by a 1-digit divisor without a remainder**

STRATEGY 1: Adapt Strategy 2 used in P.O. 3.05.07.02 for dividing a number through 999 by a 1-digit divisor without a remainder.

STRATEGY 2: Write $3\overline{)366}$ on the chalkboard. Say, "We are going to use expanded notation to help us divide." Ask a student to write the dividend in expanded form, e.g., 300+60+6. Say, "How many threes are in 3 hundreds? (100) How many threes are there in 66?" (20 threes in 60 and 2 threes in 6.) As each answer is elicited, write it on the chalkboard.

e.g.,

$$\begin{array}{r} 100 \\ 20 \\ \underline{2} \\ 122 \end{array}$$

Say, "How many groups of three are there in 366?" Ask a student to add the groups of three. Say, "We

STRATEGY 2: cont'd

can use a short way to divide." Write $3\overline{)366}$ on the chalkboard. Say, "We divide 3 into 300, 3 into 60 and 3 into 6 to find the quotient 122."

Repeat both procedure using other examples.

3.05.07.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write $3\overline{)360}$ on the chalkboard. Say, "Who will give us a word problem which can be solved by using this example?" Elicit a problem which can be solved by dividing 360 by 3. Repeat this procedure using other division examples.

STRATEGY 2: Write the following problem on the chalkboard.

> Jose has 99 stamps. He puts 9 stamps on a page in his album. How many pages does he need?

Using the steps in problem solving, elicit that division must be used to solve the problem. Ask a student to come to the chalkboard to solve the problem. Repeat this procedure using other problems.

P.O. 3.05.07.01

NAME: ______________________ CLASS: ________ DATE: ________

Work each problem. Match the problem with its answers. Write the letter of the answer above its number for a secret message.

1) 4)48

2) 2)28

3) 6)42

4) 3)63

5) 3)60

6) 2)46

7) 2)26

8) 9)72

9) 4)80

10) 7)77

11) 8)40

12) 3)36

13) 8)88

14) 3)66

15) 9)90

16) 4)88

17) 9)99

18) 2)40

Be a division dectective

N	8
O	14
V	1
Y	12
D	11
L	21
T	5
R	13
U	7
I	22
E	20
A	23

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
1 2 3 4 5 6 7 8 9 10 11 12

___ ___ ___ ___ ___ ___ !
13 14 15 16 17 18

P.O. 3.05.07.02

NAME: ____________________ CLASS: __________ DATE: ________

Divide.

1) $5\overline{)\,505}$

2) $3\overline{)\,363}$

3) $7\overline{)\,777}$

4) $3\overline{)\,539}$

5) $5\overline{)\,844}$

6) $8\overline{)\,880}$

7) $9\overline{)\,999}$

8) $2\overline{)\,486}$

9) $6\overline{)\,660}$

10) $2\overline{)\,624}$

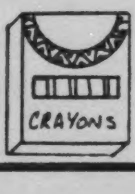
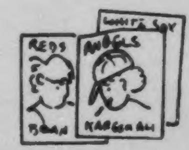
11) $4\overline{)\,488}$

12) $2\overline{)\,826}$

P.O. 3.05.07.03

NAME: ______________________ CLASS: ________ DATE: ________

Solve.

Mother had 400 pennies in a jar. She divided them into 4 equal groups. How many pennies were in each group?	$4\overline{)400}$
There were 606 crayons in one large container. Mrs. Smith decided to divide them equally and put them in 6 smaller containers. How many crayons were in each container? 	
Sue baked 55 choclate chip cookies. She put them into 5 baskets. How many cookies were in each basket?	
Tom had 990 baseball cards. He divided them into 9 equal piles. How many were in each pile? 	

3.02.05 ADDITION OF 4-DIGIT NUMBERS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.02.05.01A add two 4-digit numbers with three regroupings (exchanges), ones for tens, tens for hundreds and hundreds for thousands and check;

e.g.,

$$\begin{array}{r} 111 \\ 7685 \\ +\ 2896 \\ \hline 10581 \end{array} \qquad\qquad \begin{array}{r} \underline{\text{check}} \\ 10581 \\ -2896 \\ \hline 7685 \end{array}$$

3.02.05.02A line up a horizontal addition example in vertical format with regrouping (exchange) and check;

e.g.,

$$6432 + 41 + 837 + 95 =$$

$$\begin{array}{r} 6432 \\ 41 \\ 837 \\ \div\ 95 \\ \hline 7405 \end{array} \qquad\qquad \begin{array}{r} \underline{\text{check}} \\ 7405 \\ \hline 6432 \\ 41 \\ 837 \\ +\ \ 95 \end{array}$$

3.02.05.03B compute addition examples having sums from \$10.00 to \$99.99 and check;

e.g.,

$$\begin{array}{r} 1 \\ \$52.41 \\ +34.64 \\ \hline \$87.05 \end{array} \qquad\qquad \begin{array}{r} \underline{\text{check}} \\ \$87.05 \\ -34.64 \\ \hline \$52.41 \end{array}$$

3.02.05.04B solve word problem related to skills learned in this module.

e.g.,

John had $50.00 in his savings account. He deposited $25.00. How much money does he have in his savings account now?

$$\begin{array}{rr} & \underline{\text{check}} \\ \$50.00 & \$75.00 \\ \underline{+25.00} & \underline{-25.00} \\ \$75.00 & \$50.00 \end{array}$$

VOCABULARY

TERMS	SYMBOLS
regrouping	
exchange	
dollar sign	$
decimal	.

GETTING STARTED

Write the following example on the chalkboard.

e.g.,

$$\begin{array}{rcrcrcr} 174 & = & 100 & + & 70 & + & 4 \\ +678 & = & 600 & + & 70 & + & 8 \\ \hline & = & 700 & + & 140 & + & 12 \end{array}$$

Say, "We must regroup when there are more than 9 ones, or 9 tens, e.g., 12 = 1 ten and 2 ones." Ask a student to add the ones and regroup, add the tens and regroup and finally add the hundreds. Continue this procedure using other examples.

Write several examples on the chalkboard which show regrouping in the ones and tens columns, e.g., 236 + 195, 187 + 343. Ask two (2) students to come to the chalkboard to solve each example and then explain his/her work. Ask two (2) other students to check the answers by using the inverse operation of subtraction.

Ask the other students in the class to add the examples and do the checks in their notebooks while the work is being done on the chalkboard. Say "What do we do when we have more than 9 ones? 9 tens?" Write the procedure on the chalkboard.

Repeat the procedure using other examples.

3.02.05

3.02.05.01 **add 4-digit numbers with three regroupings (exchanges) ones for tens, tens for hundreds and hundreds for thousands and check**

STRATEGY 1: Write two 4-digit numbers in expanded notation on the chalkboard.

e.g.,

$$\begin{array}{rcl} 3475 & = & 3000 + 400 + 70 + 5 \\ \underline{+1689} & \underline{=} & \underline{1000 + 600 + 80 + 9} \end{array}$$

Say, "Regrouping occurs when there is more than 9 in any column, e.g., 5 + 9 = 10 + 4. The four remains in the ones column, and the ten is moved to the tens column." Continue to reinforce this concept by showing that 70 + 80 + 10 = 160. The 60 remains in the tens column and the one (1) hundred is moved to the hundreds column. Ask the students to solve the example. Ask a student to check the example on the chalkboard.

STRATEGY 2: Prepare an abacus showing the following example. Write $\begin{array}{r} 2965 \\ \underline{+1467} \end{array}$ on the chalkboard. Ask a student to perform the addition in the ones column. Say, "When we have 10 in the ones column, we must exchange it for 1 ten to be put in the tens column." Show the exchange on the abacus.

Adapt this procedure for the other exchanges. Ask a student to show the check by using subtraction.

3.02.05.02 **line up a horizontal addition example in vertical format with regrouping (exchange) and check**

STRAGETY 1: Say, "Fold a piece of paper into 4 columns. Label the first column on the right ONES, the next column TENS, the next column HUNDREDS and the last column THOUSANDS."

e.g., THOUSANDS | HUNDREDS | TENS | ONES

STRATEGY 1: cont'd

Write 2341 on the chalkboard. Say, "Place each digit in the appropriate column." Write 3 more numbers containing different numbers of digits, and ask the students to add these to their sheet using appropriate place value. Ask a student to add the numbers. If regrouping is necessary, add the new number in the correct column.

e.g.,

Th	H	T	O
2	3	4	1
	2	3	5
		3	2
1	0	3	2
2	6	4	0

Say, "In order to check addition with more than 2 addends, the numbers are added from bottom to top and the answer is written above the example."

Repeat this procedure.

STRATEGY 2: Prepare and distribute slips of paper to each student. Say, "Write a 3-digit number on one slip, a 2-digit number on the second slip, a 4-digit number on the third slip, and a 1-digit number on the last slip." Collect all the slips and place them inside a box. Ask a student to select 3 slips, write an addition example and find the sum. Say, "To check an example with more than 2 addends we add the numbers from the bottom up."

Repeat this procedure until all of the slips of paper are used.

3.02.05.03 **compute addition examples having sums from $10.00 to $99.99 and check**

STRATEGY 1: Draw the following chart on the chalkboard.

STRATEGY 1: cont'd

e.g.,

Sale	
Jogging Shoes	$13.95
Roller Skates	$26.75
Basketball	$ 9.85
Bowling Set	$19.98
Ping Pong Table	$54.69

Say, "Choose any two items you would like to buy. Adding money is like adding whole numbers. You must remember to use the dollar sign and a decimal point to show cents." Ask several students to compute their choices on the chalkboard.

e.g.,

$$\begin{array}{r} \$13.95 \\ \underline{+\ \ 9.95} \\ \$23.90 \end{array}$$

Say, "To check the answer, use the same procedure as you do with whole numbers."

e.g.,

$$\begin{array}{r} \$23.90 \\ \underline{-13.95} \\ \$\ 9.95 \end{array}$$

STRATEGY 2: Prepare and distribute advertisements from a newspaper. Say, "We are going to play a game. Make believe that you have $50.00 to spend on anything you want. Look through the advertisement page and find the items you wish to buy. Write down on a piece of paper the amount of money spent on each item and find the sum of all the items." At the end of the activity, ask the students to share with the class the items purchased and the amounts spent. Say, "How can you check your sums to make sure you did not exceed the $50.00?" Demonstrate a check using examples from the students.

3.02.05.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Write a problem on the chalkboard.

Ann and her family traveled 365 miles on Monday, and 1589 miles the rest of the week. How far did they travel altogether?

Ask the students to find key words which can help in solving the problem. Say, "What operation will we use to solve this problem? (addition) What key words told us the operation to use? What is the word we use to describe the answer?" Ask the class to estimate their answer and solve the problem. Say, "Was your estimate reasonable? How close to your answer is it? Did you check your answer to make sure it was correct? Explain how you checked it."

Repeat this procedure using other word problems.

STRATEGY 2: Adapt Strategy 2 used in P.O. 3.02.05.03.

P.O. 3.02.05.01

NAME:________________ CLASS:________ DATE:________

In order to complete each addition box, add the numbers across, and the place value columns down.

3000	400	50	9	
1000	200	40	1	

4000	600	60	8	
2000	500	50	3	

5000	700	90	5	
2000	100	30	5	

1000	800	60	7	
4000	300	30	4	

P.O. 3.02.05.02

NAME: ____________________ CLASS: __________ DATE: __________

Line up each example. Add and check.
Use the code to find the secret message.

1. 3402 + 78 + 123 + 15 =

	check
3402	15
78	123
123	78
15	3402

2. 235 + 7210 + 503 + 12 =

3. 95 + 1053 + 757 + 9 =

4. 123 + 7831 + 4206 + 17 =

5. 1032 + 8 + 615 + 23 =

6. 673 + 92 + 821 + 4625 =

7. 3 + 995 + 1059 + 67 =

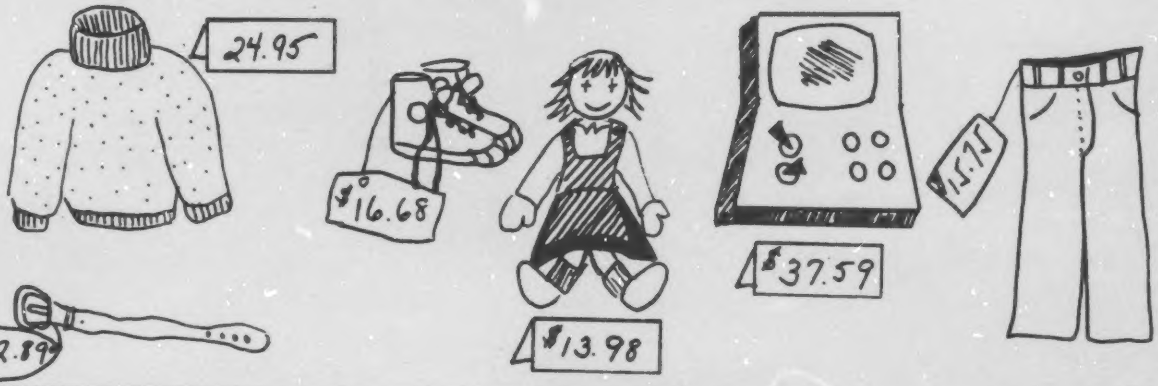
7960	6411	3618	12177	2124	1914	1678
I	O	R	H	N	G	T

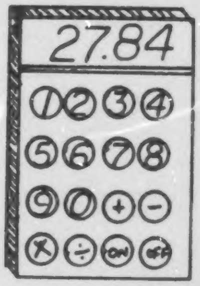
1	2	3	4	5	6	7

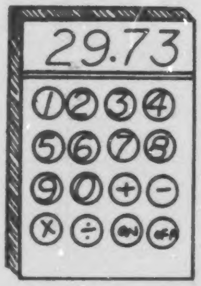
P.O. 3.02.05.03

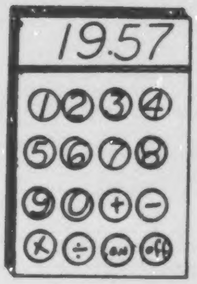
NAME: ______________________ CLASS: ________ DATE: ________

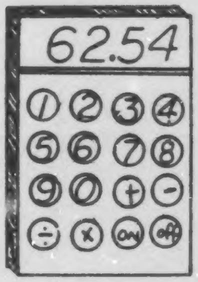
Read the amount on the calculator.
Look at the prices of the items.
Find two items to buy with prices that total the amount on the calculator.

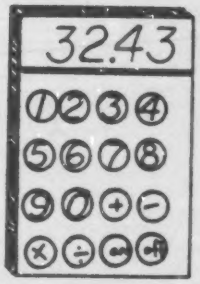

24.95
$16.68
$13.98
$37.59
15.75
$2.89

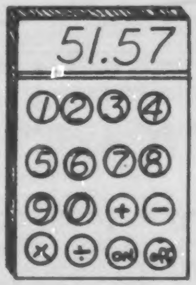








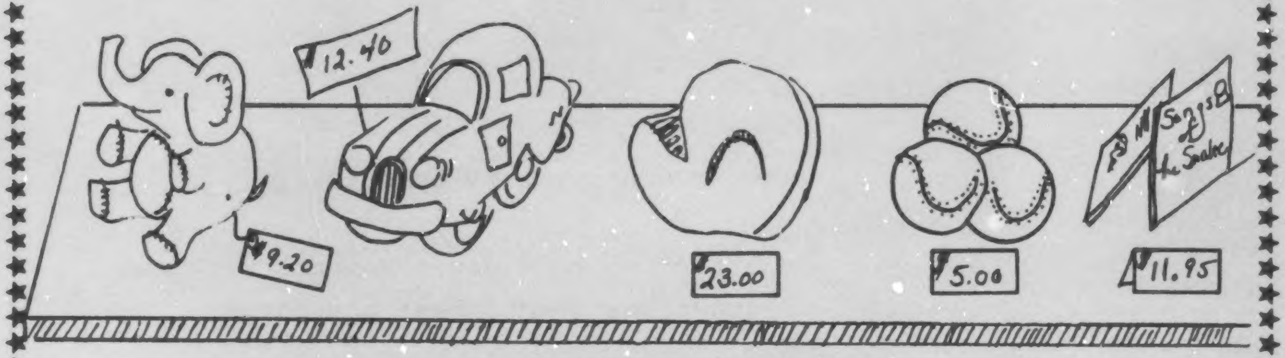




P.O. 3.02.05.04

NAME: ______________________________ CLASS: ________ DATE: _______

Make up your own problem.



You have learned how to solve addition problems. Make up some problems of your own. Be sure you can solve the problems that you make up!

The picture shows some toys and their prices. Use the facts in the picture to make up addition problems. The first one is done.

1. Ann bought one album and one game. How much money did she spend in all?

2. Another addition problem:

3. Another addition problem:

Unit 51

3.03.03 SUBTRACTION WITH MORE THAN ONE REGROUPING (EXCHANGE)

(3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.03.03.01A subtract up to 4-digit numbers with two regroupings (exchanges) and check; e.g.,

$$\begin{array}{r} \overset{1}{\cancel{2}}\overset{13}{\cancel{4}}\cancel{3} \\ -\underline{158} \\ 85 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ 85 \\ +\underline{158} \\ 243 \end{array}$$

$$\begin{array}{r} \overset{5}{\cancel{6}}\overset{11}{\cancel{2}}\overset{14}{\cancel{5}}{}^{1}4 \\ -\underline{4897} \\ 1357 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ 1357 \\ +\underline{4897} \\ 6254 \end{array}$$

3.03.03.02B compute subtraction examples having minuends to \$99.99 with two or more regroupings (exchanges) and check; e.g.,

$$\begin{array}{r} \$\overset{5}{\cancel{6}}\overset{14}{\cancel{5}}.{}^{1}32 \\ \underline{-35.91} \\ \$29.41 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ \$29.41 \\ \underline{+35.91} \\ \$65.32 \end{array}$$

221

428

3.03.03.03B compute subtraction examples having multiples of one hundred or one thousand as minuends and check;

e.g.,

$$\begin{array}{r} \overset{3}{\cancel{4}}\overset{9}{\cancel{0}}\overset{9}{\cancel{0}}\overset{10}{\cancel{0}} \\ -\underline{2346} \\ 1654 \end{array} \qquad\qquad \begin{array}{r} \underline{\text{check}} \\ 1654 \\ +\underline{2346} \\ 4000 \end{array}$$

3.03.03.04A solve word problems related to skills learned in this module.

e.g.,

A plane flew 5685 miles. Its destination is 8321 miles away. How many more miles will it fly to reach its destination?

$$\begin{array}{r} \overset{7}{\cancel{8}}\overset{12}{\cancel{3}}\overset{11}{\cancel{2}}\overset{11}{\cancel{1}} \\ -\underline{5685} \\ 2636 \end{array} \text{ more miles to fly}$$

VOCABULARY

TERMS

difference
subtrahend
minuend
regroup (exchange)

GETTING STARTED

Distribute squared material to each student. Write a subtraction example on the chalkboard, e.g., $\begin{array}{r}42\\-17\\\hline\end{array}$.

Say, "Use your squared materials and work along with me. Remember that you subtract one column at a time. You may have to regroup." Develop the following steps.

Step 1	Step 2	Step 3
Not enough ones Regroup 1 ten to 10 ones	Subtract ones	Subtract tens
$\begin{array}{r}42\\-17\\\hline\end{array}$	$\begin{array}{r}42\\-17\\\hline5\end{array}$	$\begin{array}{r}42\\-17\\\hline25\end{array}$

Repeat using other examples with regrouping (exchange) from tens to ones.

Divide the class into two teams, the "X"s and "O"s. Say, "We are going to play a game of "Tic-Tac-Toe." The first team member to get the correct answer may place his X or O anywhere in the tic-tac-toe grid that he chooses. The first team to get three across, down or diagonally is the winner."

Ask the first person from each team to come to the chalkboard and dictate a subtraction problem with one regrouping.

e.g., $\begin{array}{r}84\\-56\\\hline\end{array}$

Continue playing until one team has made tic-tac-toe.

3.03.03

3.03.03.01 **subtract up to 4-digit numbers with two regroupings (exchanges) and check**

STRATEGY 1: Say, "Pretend that you are in the gum business. Gum comes in cartons of 10 packages and each package has 10 sticks (100 sticks in all). When you sell gum, you want to keep track of how much you have left. If you started your business with 621 sticks and sold 472 sticks, how many sticks are left?" Write the following on the chalkboard.

621		6 cartons	2 packages	1 stick
-472	-	4 cartons	7 packages	2 sticks

1st exchange		6 cartons	1 package	11 sticks
	-	4 cartons	7 packages	2 sticks
				9 sticks

2nd exchange		5 cartons	11 packages	11 sticks
	-	4 cartons	7 packages	2 sticks
		1 carton	4 packages	9 sticks

Say, "To check our work we use addition. If the sum is the same as the minuend, we know our example is correct." Write the following on the chalkboard.

	Difference		149
+	Subtrahend	+	472
	Minuend		621

STRATEGY 2: Hold an abacus or a bead board vertically. Write $\begin{array}{r}6342\\ \underline{-4457}\end{array}$ on the chalkboard. Ask two students to solve the example, one using the abacus and another at the chalkboard.

Say, "We can't take 7 ones from 2 ones. What shall we do?" (exchange 1 ten for 10 ones) Flip over 1 ten and replace it with 10 ones. Say, "Now we have 12 ones. If you take 5 ones away, what is left?" (7) Continue this procedure until the example is completed.

3.03.03

3.03.03.02 **compute subtraction examples having minuends to $99.99 with two or more regroupings (exchanges) and check**

STRATEGY 1: Say, "I had $15.50 to spend on hair ribbons. I went shopping and spent $12.85. How much money did I have left?" Write the example on the chalkboard.

e.g.,

$$\begin{array}{r} \$15.50 \\ \underline{-12.85} \end{array}$$

Say, "Can I take 5 away from 0? (No) I must exchange 1 ten for 10 ones. How many tens are left? (4) How much is 10 take away 5?" (5) Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} \$1\overset{4}{\cancel{5}}.\overset{14}{\cancel{5}}0 \\ \underline{-12.85} \\ 5 \end{array}$$

Point to the tens place and make the necessary exchange. Complete the subtraction. Remind the students to include the decimal point and dollar sign in the answer.

e.g.,

$$\begin{array}{r} \$1\overset{4}{\cancel{5}}.\overset{14}{\cancel{5}}0 \\ \underline{-12.85} \\ \$\ 2.65 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ \$\ 2.65 \\ \underline{+12.85} \\ \$15.50 \end{array}$$

Say, "How much money did I have left? Let's check our work by adding the change to the amount we spent. If our answer equals what we started with we know we are right."

STRATEGY 2: Prepare play money. Say, "Pretend we have a store. John is going to be the cashier. Mary will be the shopper. Mary has $25.50 to spend. She buys a jacket for $16.89. How much change will John give her?"

Ask John to use the play money to work out the

STRATEGY 2: cont'd

example while another student solves it at the chalkboard.

e.g.,

$$\begin{array}{r} \$\overset{1}{\cancel{2}}\overset{14}{\cancel{5}}.\overset{14}{\cancel{5}}0 \\ \underline{-16.89} \\ \$\ 8.61 \end{array} \qquad \begin{array}{r} \underline{\text{Check}} \\ \$\ 8.61 \\ \underline{+16.89} \\ \$25.50 \end{array}$$

Remind the students to include the dollar sign and the decimal point in their answer. Say, "To check, add the change to the purchase price. If it matches the amount we started with we know we are right."

Continue this procedure using other numbers.

3.03.03.03 **compute subtraction examples having multiples of one hundred or one thousand as minuends and check**

STRATEGY 1: Draw a place value chart on the chalkboard. Write this example in the chart.

e.g.,

$$\begin{array}{cccc} \text{Th} & \text{H} & \text{T} & \text{O} \\ 4 & 0 & 0 & 0 \\ \hline -2 & 3 & 4 & 6 \end{array}$$

Say, "Can we subtract in the ones column? tens column? hundreds column? (No) We must exchange 1 thousand for ten hundreds. Now we can exchange 1 hundred for 10 tens and 1 ten for 10 ones." Write the following on the chalkboard:

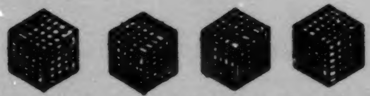
$$\begin{array}{cccc} \text{Th} & \text{H} & \text{T} & \text{O} \\ \overset{3}{\cancel{4}} & \overset{9}{\cancel{0}} & \overset{9}{\cancel{0}} & 10 \\ \hline -2 & 3 & 4 & 6 \end{array}$$

Say, "Now we can subtract." Ask a student to come to the chalkboard and subtract. Ask a second student to check. Continue this procedure using other numbers.

STRATEGY 2: Prepare a demonstration set of multibase blocks. Ask a student to show 4000 using the blocks.

STRATEGY 2: cont'd

e.g.,



(4 cubes)

Say, "I want to take away 2,346. Can I do this using only cubes? (no) Jason, exchange 1 thousand cube for 10 hundred flats. Marshall, exchange 1 hundred flat for 10 ten bars and 1 ten bar for 10 units. Now we can do the subtraction. We have 3 thousands, 9 hundreds, 9 tens and 10 ones." Ask a student to perform the subtraction.

Write the following on the chalkboard:

$$\begin{array}{rcl} 4000 & = & 3000 + 900 + 90 + 10 \\ \underline{-2346} & = & \underline{2000 + 300 + 40 + 6} \\ & & 1000 + 600 + 50 + 4 \end{array}$$

Say, "We add all of the remaining blocks to find the answer 1654." Ask a student to check using addition.

Continue this procedure using other numbers.

3.03.03.04 solve word problems related to skills learned in this module

STRATEGY 1: Write the following word problem on the chalkboard.

> A plane flew 5,685 miles. Its destination is 8321 miles away. How many more miles must it fly to reach its destination?

Ask the students to read the problem, select the proper operation, key words, estimate and then solve the problem.

Repeat this procedure with other word problems.

STRATEGY 2: Write the following problem on the chalkboard.

> Mr. Smith ordered 2000 pencil cases from the factory. He sold 1,186. How many did he have left?

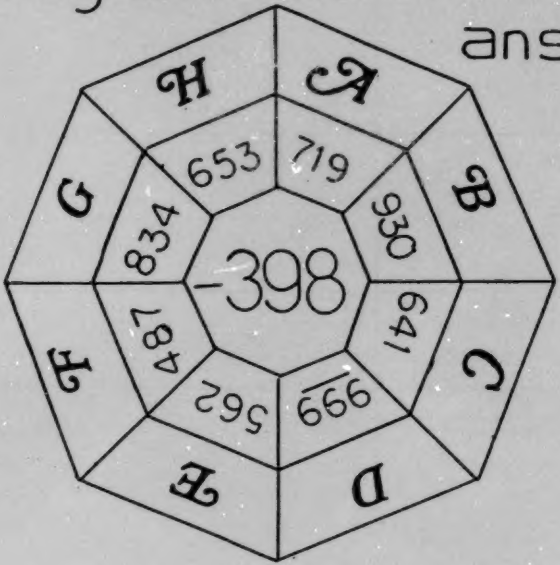
Ask the students to find the key words, choose the correct operation, estimate the answer, solve, label the answer and check.

P.O. 3.03.03.01

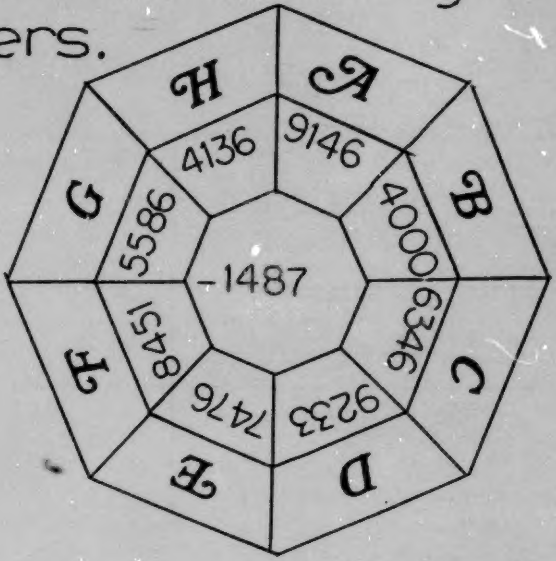
NAME: ________________________ CLASS: __________ DATE: ________

Subtract and check your answers by using addition.
Use the letters to label your answers.
Make sure you subtract the smaller number from the larger number.

Subtract and check your answers by using addition. Use the letters to label your answers.



H
A
B
C
D
E
F
G
653
719
930
641
666
562
487
834
-398



H
A
B
C
D
E
F
G
4136
9146
4000
6346
9233
7476
8451
5586
-1487

A. 719
-398

E

B

F

C

G

D

H

A. 9146
-1487

E

B

F

C

G

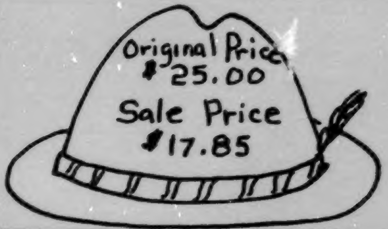
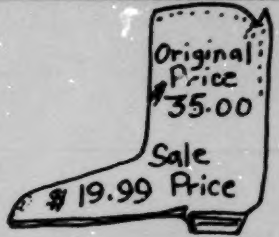
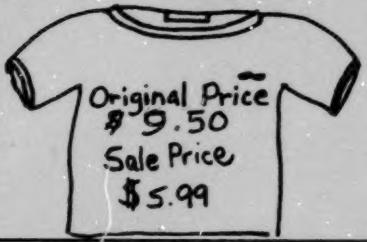
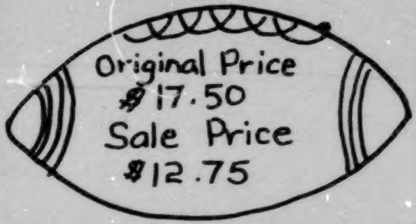
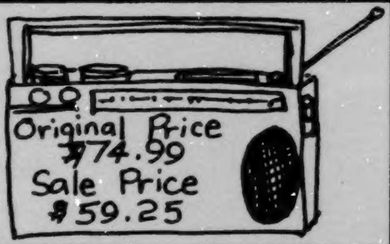
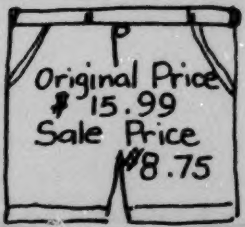
D

H

P.O. 3.03.03.02

NAME: ______________________ CLASS: ________ DATE: ________

Subtract the sale price from the original price of each item.
How much money can you save?

ITEM	EXAMPLE	MONEY SAVED
 Original Price $25.00 Sale Price $17.85	$\cancel{\$}\,\overset{1}{2}\overset{14}{\cancel{5}}.\overset{9}{\cancel{0}}\overset{10}{\cancel{0}}$ -17.85 $\$\ 7.15$	$7.15
 Original Price $35.00 Sale Price $19.99		
 Original Price $9.50 Sale Price $5.99		
 Original Price $17.50 Sale Price $12.75		
 Original Price $74.99 Sale Price $59.25		
 Original Price $15.99 Sale Price $8.75		

P.O. 3.03.03.03

NAME: ______________________ CLASS: __________ DATE: ________

Subtract and check your answer by making a separate addition. example. Study this example.

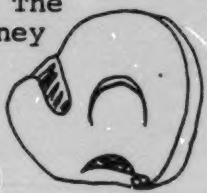
EXAMPLE	rename hundreds	rename tens	subtract	check
$\begin{array}{r} 500 \\ -146 \\ \hline \end{array}$	$\begin{array}{r} \overset{4}{\cancel{5}}\overset{10}{\cancel{0}}0 \\ -146 \\ \hline \end{array}$	$\begin{array}{r} \overset{4}{\cancel{5}}\overset{9}{\cancel{0}}\overset{10}{\cancel{0}} \\ -146 \\ \hline \end{array}$	$\begin{array}{r} \overset{4}{\cancel{5}}\overset{9}{\cancel{0}}\overset{10}{\cancel{0}} \\ -146 \\ \hline 354 \end{array}$	$\begin{array}{r} 354 \\ +146 \\ \hline 500 \end{array}$

Example	Check	Example	Check
① $\begin{array}{r} 500 \\ -195 \\ \hline \end{array}$		⑤ $\begin{array}{r} 6000 \\ -2987 \\ \hline \end{array}$	
② $\begin{array}{r} 800 \\ -123 \\ \hline \end{array}$		⑥ $\begin{array}{r} 9000 \\ -6432 \\ \hline \end{array}$	
③ $\begin{array}{r} 300 \\ -222 \\ \hline \end{array}$		⑦ $\begin{array}{r} 4000 \\ -1996 \\ \hline \end{array}$	
④ $\begin{array}{r} 400 \\ -216 \\ \hline \end{array}$		⑧ $\begin{array}{r} 7000 \\ -4978 \\ \hline \end{array}$	

P.O. 3.03.03.04

NAME: ______________________________ CLASS: ________ DATE: ________

Solve each problem.
Subtracting money is the same as subtracting numbers.
* Remember to use $ and . in your answer.

John is saving his money to buy a baseball glove. He has already saved $4.50. The glove costs $9.99. How much more money does John have to save? 	WORK HERE
Mary wants to buy her mother a birthday present. The dress she wants costs $22.50. Mary has saved $15.99. How much more money does Mary need?	
Michael is going on a trip. The train ticket costs $23.99. Michael pays the ticket person $30.00. How much change should he get back?	
Sally went to the fruit store for her mother. She bought apples, oranges, bananas and grapes. The total cost for the fruit was $8.16. She paid the storekeeper with $10.00. How much change did she get back?	
Tom wants to buy a toy that costs $8.99. He has already saved $3.59. How much more does Tom have to save?	

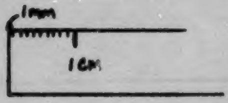
3.10.07 LINEAR MEASUREMENT-METRIC

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.10.07.01B identify a millimeter as a tenth of a centimeter and use the abbreviation mm; e.g.,



3.10.07.02B identify equivalent metric units of length.
e.g.,

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

3.10.07

VOCABULARY

TERMS	SYMBOLS
meter	
centimeter	
kilometer	
decimeter	
millimeter	mm

GETTING STARTED

Make a class prefix chart by eliciting the meanings of milli, centi, and kilo from the students. Keep the chart hanging in the classroom to facilitate the teaching of metrics as well as prefixes.

Ask the students to count by tens from 10 to 100 in unison, and then call on individual students to count. Prepare and distribute squared material to each student. Ask the students to show 10 ones = 1 ten. Repeat this procedure for hundreds and thousands.

3.10.07

3.10.07.01 **identify a millimeter as a tenth of a centimeter and use the abbreviation mm.**

STRATEGY 1: Prepare and distribute rulers marked in millimeters. Say, "Into how many equal parts is the centimeter divided? (10) Each part is 1 millimeter long. The symbol for millimeter is mm." Write mm on the chalkboard. Say, "How many millimeters are there in 1 centimeter? (10) What part of a centimeter is 1 millimeter?" ($\frac{1}{10}$)

Ask the students to use the rulers to investigate the tens relationship between centimeters and millimeters.

e.g.	cm	mm
	1	10
	2	20

STRATEGY 2: Distribute centimeter rulers and paper clips to each student. Say, "Sometimes we have to measure objects that are very small. Measure the width of the paper clip using your centimeter ruler. The width is less than 1 centimeter. How can we find the length of a paper clip? (count lines) Each of these lines represents a mm. A paper clip is about 8 mm wide. How many mm are there in one centimeter? (10) 10 mm equal one cm. The abbreviation for the word millimeter is mm." Write 10 mm = 1 centimeter. Use the millimeters on a metric ruler to measure the width of a pencil, the width of a small book and the width of a ruler.

3.10.07.02 **identify equivalent metric units of length**

STRATEGY 1: Prepare and distribute a meter stick, decimeter strips and centimeter rulers. Display the meter

STRATEGY 1: cont'd

stick. Say, "The basic metric unit of length is called a meter. We will use the meter to measure objects in the classroom." Ask several students to measure small objects, e.g., books, using the meter stick. Say, "The meter is too large a measure for this purpose. There is a smaller metric measure of length. It is made by dividing the meter into ten equal parts. It is called a decimeter. The prefix deci means ten and a decimeter is one tenth of a meter." Write 1 meter = 10 decimeters on the chalkboard. Ask the students to measure books using the decimeter strip. Say, "Can we use decimeters to measure pencils, erasers, chalk or crayons? A smaller unit of measure is needed. It is called a centimeter. We divide the meter into 100 equal parts. The prefix centi means one hundred. 100 centimeters is equal to one meter." Write 100 centimeters = 1 meter on the chalkboard. Ask the class to measure small objects using the centimeter ruler.

Say, "When you ride on the highways there are signs that tell you how far you have to travel to reach your destination. The signs often give distance in kilometers. A kilometer is the longest metric measure. If we took a thousand meter sticks and placed them in a line, they would equal 1 kilometer." Write 1000 meters = 1 kilometer on the chalkboard.

STRATEGY 2: Prepare and distribute centimeter rulers. Say, "This is a centimeter ruler. Each line represents one centimeter. A centimeter is one hundredth of a meter. Use this ruler and measure your pencil.

STRATEGY 2: cont'd

How many centimeters long is your pencil?" Display a meter stick. Say, "This is a meter." Use the centimeter rulers placed on top of the meter stick to show that 100 centimeters = 1 meter. Write this on the chalkboard. Say, "When we divide the meter into 100 equal parts each part is called a centimeter. When we divide the meter into ten equal parts each part is called a decimeter because deci means ten. If we took a thousand meter sticks and put them end to end in a long train, we would have the longest metric unit of length, a kilometer." Write on the chalkboard, 1 kilometer = 1000 meters. Say, "Kilometers are used for measuring distances from one place to another." Point to objects in the classroom and say, "Which metric measure would we use to measure this object?"

P.O. 3.10.07.01

NAME:________________________________ CLASS:__________ DATE:________

I. Fill in the blanks with the correct metric measure.

II. Write the measure you would use for each item. Meters, centimeters, kilometers.

I

100 ____________ = 1 __________

1 ____________ = 1000 ____________

10 ____________ = 1 ____________

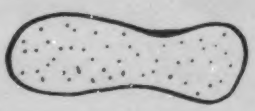
II

1. The length of a pencil ____________
2. The distance from your house to another state ________
3. The length of the classroom ____________
4. The height of a tree ____________
5. The height of your chair ____________
6. The length of a text book ____________
7. The length of your finger ____________
8. The speed you travel on a highway ____________
9. The distance between New York and Chicago ________
10. The length of a leaf ____________

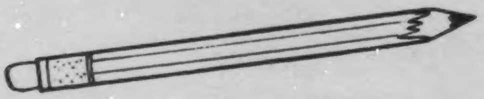
P.O. 3.10.07.02

NAME: ________________________ CLASS: ________ DATE: ________

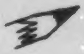
Circle the metric measure you would use to measure each item. Remember to choose the measure which is the most accutate.



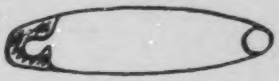
cm mm



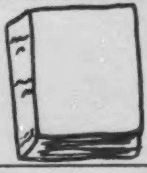
cm mm



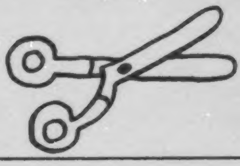
cm mm



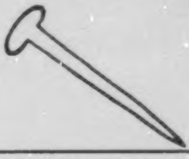
cm mm



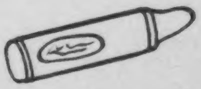
cm mm



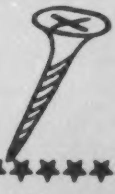
cm mm



cm mm



cm mm



cm mm

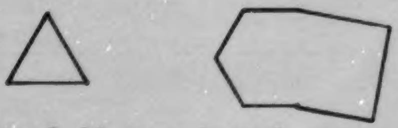
3.09.05 POLYGONS

(2-3 lessons)

PERFORMANCE OBJECTIVES

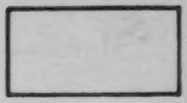
The student will be able to...

3.09.05.01B recognize and define a polygon;
e.g.,

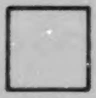


3.09.05.02B define quadrilateral and recognize the following as quadrilaterals: parallelogram, rectangle, square, rhombus, trapezoid;
e.g.,

PARALLELOGRAM



RECTANGLE

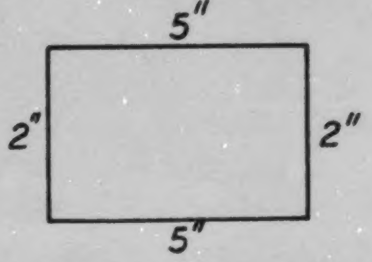


SQUARE

RHOMBUS

TRAPEZOID

3.09.05.03A define perimeter as the sum of the lengths of the sides of a quadrilateral.
e.g.,



P = 2" + 5" + 2" + 5" = 14"

3.09.05

VOCABULARY

TERMS	**SYMBOLS**
polygon	
line segment	(•————•)
quadrilateral	
parallelogram	
rectangle	
square	
rhombus	
trapezoid	
perimeter	

GETTING STARTED

Prepare and distribute several different polygons to the students, e.g., plastic shapes. Ask the students to examine each shape. Say, "We are going to play a game." Each polygon previously presented will now appear on index cards, e.g., rectangle . The matching diagram will be drawn on another set of index cards, e.g., Write a number on the back of each card and place them face down on a desk. Say, "The object of the game is to find the two pictures that match. Choose two cards. Turn over the cards to reveal the name and pictures. If the pictures match, keep the pair and continue your turn. If the word and picture do not match, return the cards to the correct pile and the next student will take your place." Continue playing this game until all cards have been properly matched.

Draw the symbol for a line (<———>) and line segment (•——•) on the chalkboard. Say, "A line goes on and on in both directions and a line segment stops." A line segment is a portion of a line. Draw a triangle on the chalkboard, e.g., △ . Say, "Is the triangle made of lines or line segments? How many line segments does the triangle have?" Present a supply of cut out figures to the students and ask them to count the sides.

3.09.05

3.09.05.01 **recognize and define a polygon**

STRATEGY 1: Write the following headings at the chalkboard. e.g.,

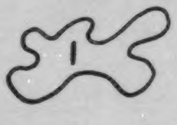
Simple Closed Curves   Complex Closed Curves

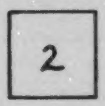
Prepare and display a set of index cards with a shape drawn on it. Say, "What type of curve is this? Draw the shape under the correct heading." Continue this procedure until all of the cards are used. Say, "Circle all of the polygons on the chalkboard. Look at all of the circled shapes. How are these simple closed curves alike? (All are made up of line segments.) The name given to these simple closed curves is polygon." Write the word and the definition on the chalkboard.

Say, "Draw various polygons in your notebook." Ask students to draw different shapes on the chalkboard. Refer to each one separately and say, "Is this a polygon?" If it is, write the word polygon under the figure.

STRATEGY 2: Draw two simple closed curves on the chalkboard. One must be a polygon.

e.g.,

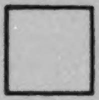




Say, "What is the same about these two figures?" (Both are simple closed curves.) Say, "What makes figure #2 different from figure #1?" (Figure #2 is made up of line segments.) Say, "Figure #2 and others like it are special simple closed curves. They are called polygons. A polygon is made up of line segments called sides." Draw figures on the chalkboard. Ask students to identify the polygons.

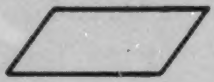
3.09.05.02 **define quadrilateral and recognize the following as quadrilaterals: parallelogram, rectangle, square, rhombus, trapezoid**

STRATEGY 1: Write the following headings on the chalkboard. e.g.,

Polygon	Number of Sides	Number of Corners
		

Draw a shape under the heading Polygon. (All of the shapes drawn will have four sides.) Say, "Look at the polygon. How many sides does it have? (4) How many corners does it have?" (4) Fill in the chart. Draw another shape. Follow the same procedure. Say, "What is the same about all of these polygons? (4 sides and 4 corners) What is different about these polygons? (Each of the polygons has a different shape.) These polygons are called quadrilaterals. A quadrilateral is a polygon with 4 sides." Ask the students to draw quadrilaterals in their notebooks.

STRATEGY 2: Draw a large square and rectangle on the chalkboard. Point to the square. Ask the students to identify objects that have the same shape. Repeat this procedure using the rectangle. Ask the students for the number of sides in the square and the number of sides in the rectangle. Draw a picture of a parallelogram on the chalkboard. e.g.,

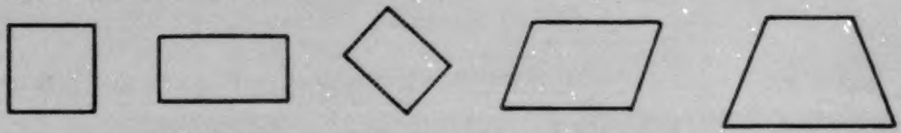


Say, "This polygon has the same number of sides as the square and rectangle. All of these polygons are called quadrilaterals. A quadrilateral is a polygon with 4 sides. There are some quadrilaterals

STRATEGY 2: cont'd

that are special and have other names because of their unique shapes." Draw a square, a rectangle, a parallelogram, a rhombus and a trapezoid on the chalkboard and ask the students to determine if they are quadrilaterals.

e.g.,



3.09.05.03 **define perimeter as the sum of the lengths of the sides of a quadrilateral**

STRATEGY 1: Prepare and distribute rulers. Say, "Imagine that your desks are gardens. In the gardens there are beautiful flowers. One way we can keep the flowers from being stepped on is to put a fence around the garden. Where would you build the fence?" Draw a garden with a fence around its edge on the chalkboard. Say, "The sides of the garden must be measured to find out how much fencing is needed. Measure each side of your desk." Ask a student to record the measurements on the chalkboard. Say, "Add the measures of the lengths of all four sides to determine how much fencing you need." Write a corresponding number sentence at the chalkboard.

e.g.,

8" + 12" + 8" + 12" =

Ask a student to solve the equation. Say, "The four sides of a quadrilateral make up the perimeter of the polygon. The perimeter is the sum of the the lengths of a quadrilateral."

Repeat this procedure with other examples.

STRATEGY 2: Prepare and distribute rulers and cutouts of quadrilaterals to each student. Draw a quadrilateral on the chalkboard. Ask a student to measure and record the sides of the figure. Say, "The distance around the quadrilateral is called the perimeter. We find the perimeter by adding the measures of the lengths of all four sides." Ask a student to add the lengths.

e.g.,

4" + 2" + 4" + 2" = 12"

Ask the students to measure the lengths of the sides of their quadrilateral and find the perimeter. Repeat this procedure by exchanging shapes.

P.O. 3.09.05.01

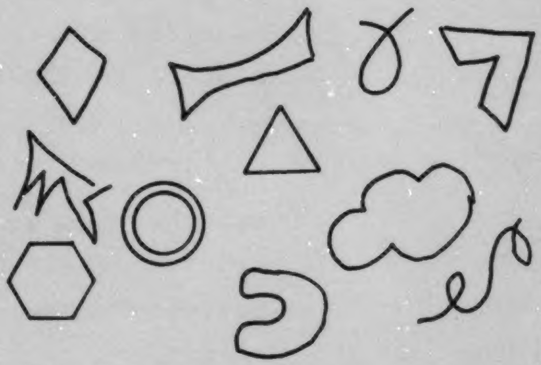
NAME:______________________________ CLASS:__________ DATE:________

Cut out cards on the dotted lines. Fasten together.
Complete activities on each card.

Card #1

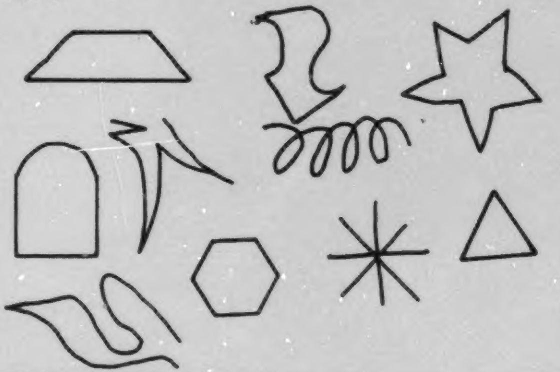
Card #2

Circle all polygons



Card #3

Circle those that are not polygons.



Card #4

Draw any polygon.

Card #5

Complete each statement with a word from the word box.

polygon   simple closed curve   line segments

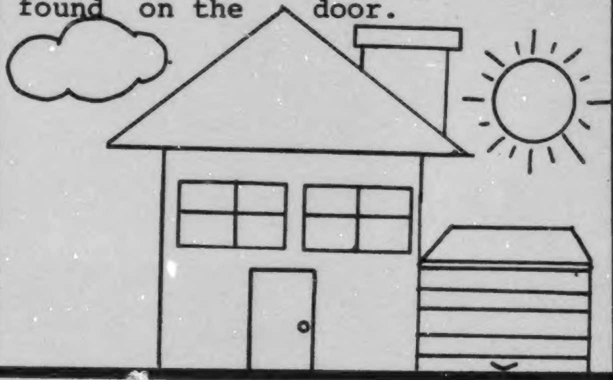
1. A polygon must be a __________.

2. Polygons are made up entirely of ____________.

3. This shape   is a ____________.

Card #6

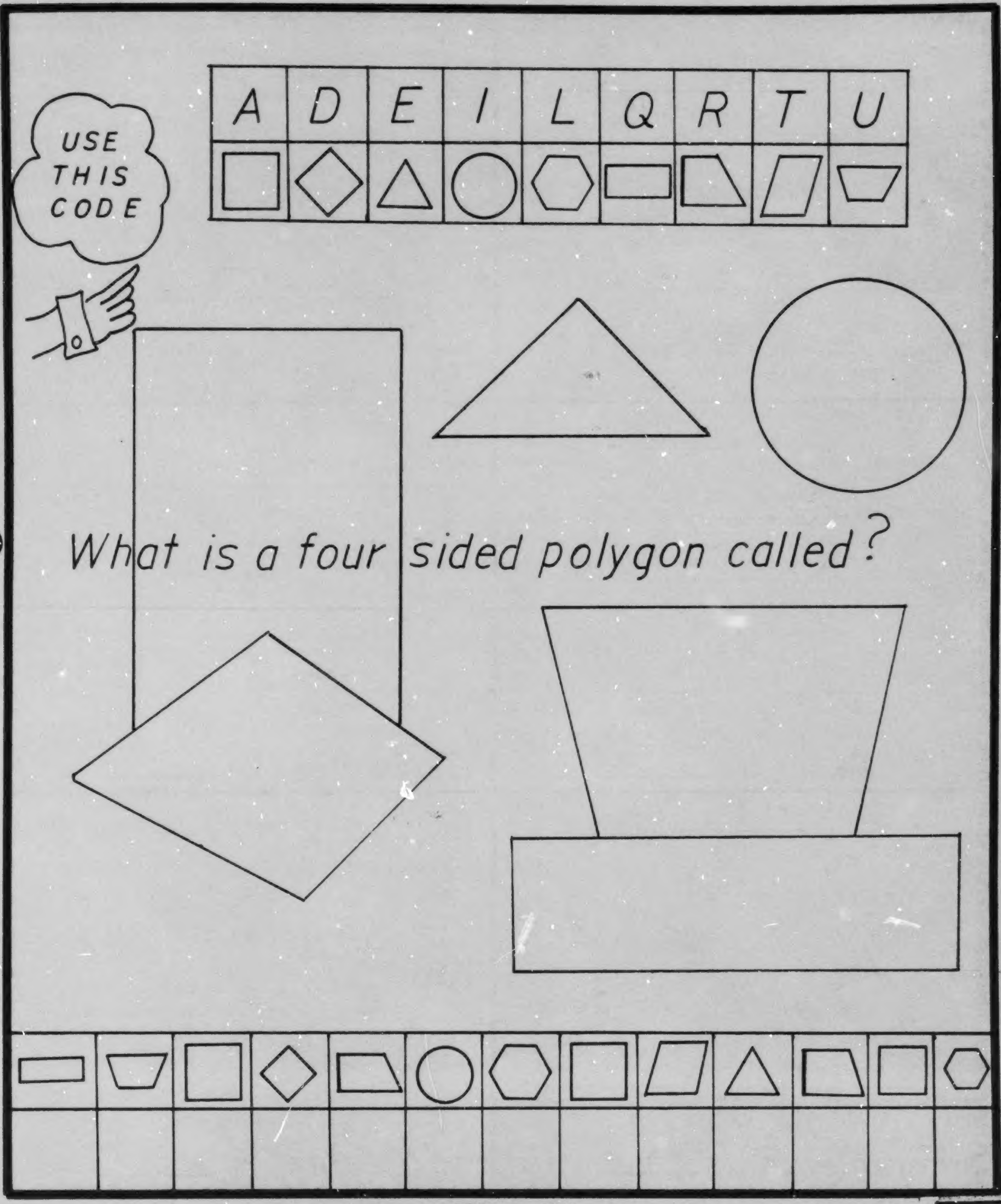
Circle all of the polygons you can find in this house. Write
Write the total number you have found on the door.



P.O. 3.09.05.02

NAME:______________________________ CLASS:__________ DATE:________

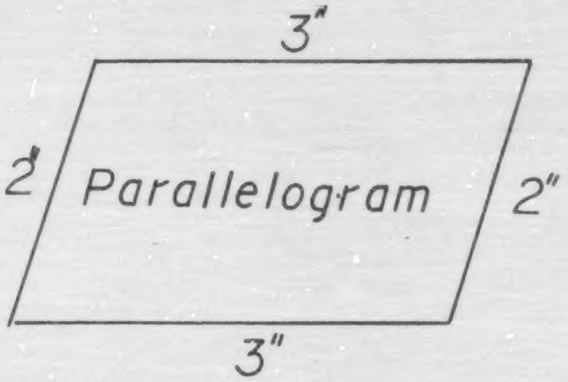
Match the shapes to find the answer. "What is a four sided polygon called?"


USE THIS CODE
A
D
E
I
L
Q
R
T
U
What is a four sided polygon called?

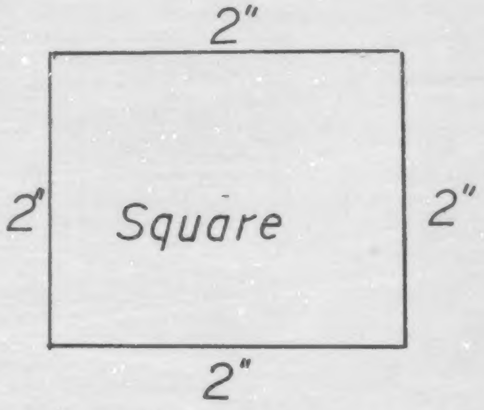
P.O. 3.09.05.03

NAME: ____________________ CLASS: ________ DATE: ________

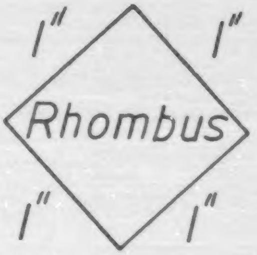
Find the perimeter.


3"
2"
Parallelogram
2"
3"

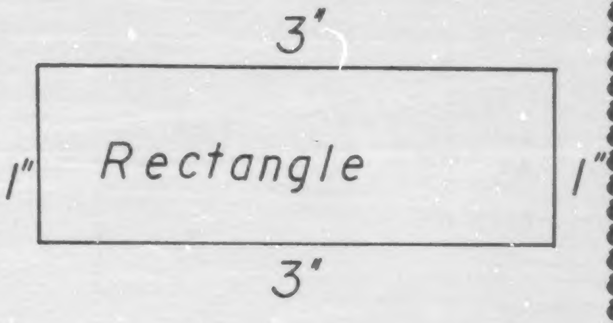
Perimeter is ______


2"
2"
Square
2"
2"

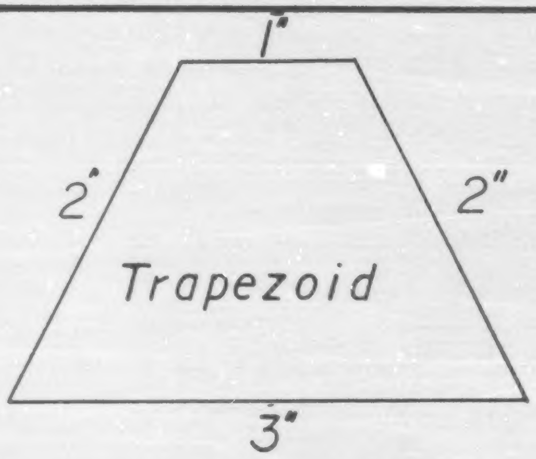
Perimeter is ______


1"
1"
Rhombus
1"
1"

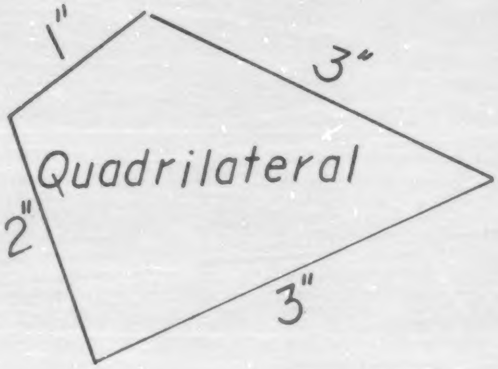
Perimeter is ______


3"
1"
Rectangle
1"
3"

Perimeter is ______


1"
2"
2"
Trapezoid
3"

Perimeter is______


1"
3"
Quadrilateral
2"
3"

Perimeter is ______

3.07.01 DECIMALS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.07.01.01B identify and read a decimal;
e.g.,
1.4
Say, "one and four tenth."

3.07.01.02B write whole numbers and tenths as decimals;
e.g.,
$2 + \frac{3}{10} = 2 + .3 =$
2 and 3 tenths is 2.3

3.07.01.03B count by tenths.
e.g.,
0.1, 0.2, 0.3, 0.4, 0.5, 0.6,
0.7, 0.8, 0.9, 1.0, 1.1, 1.2...

3.07.01

VOCABULARY

TERMS	SYMBOL
decimal	
tenths	
decimal point	
whole number	

GETTING STARTED

Write 973 on the chalkboard. Say, "In which place is the 9?" (the hundreds place) Repeat this procedure for the tens place and the ones place. Say, "What do we call a number that is less than one?" (a fraction) Ask a student to come to the chalkboard to write a fraction. Say, "What do we call a whole number plus a fraction?" (a mixed number) Ask a student to write a mixed number on the chalkboard. Say, "The fraction is always written to the right of the whole number in a mixed number."

Prepare and distribute squared material, e.g., tens strips and units. Ask the students to use this material to show the following: $3 \frac{1}{10}$ (3 tens + 1 unit), $4 \frac{3}{10}$ (4 tens + 3 units), $6 \frac{2}{10}$ (6 tens + 2 units). Reverse the procedure and display strips and units and ask the students to come to the chalkboard to write the number, e.g., 3 strips + 4 units = $3 \frac{4}{10}$.

456

3.07.01

3.07.01.01 **identify and read a decimal**

STRATEGY 1: Prepare and distribute a squared material 10-strip to each student. Say, "This ten-strip will equal one whole. How many equal parts has the strip been divided into? (10) Each part is $\frac{1}{10}$. $\frac{1}{10}$ may be written .1. Write $\frac{1}{10}$ = .1. The dot written before the 1 is called a decimal point. The number directly to the right of the decimal point is read as one tenth." Write the following on the chalkboard.

e.g.,

$\frac{2}{10}$, $\frac{6}{10}$, $\frac{4}{10}$ .2, .6, .4

Ask a student to come to the chalkboard and match the fractions with the decimals, e.g., $\frac{2}{10}$ = .2

STRATEGY 2: Prepare a flannel board and a circle cut into ten equal parts. Say, "How many parts are in this circle? (10) What is each part called ($\frac{1}{10}$)." Write $\frac{1}{10}$ on the chalkboard. Say, "Tenths may be written another way." Write .1 on the chalkboard. Say, "A decimal point followed by a number is read as tenths." Write the following on the chalkboard, .6, .3, .9, and read each to the students. Ask a student to show the number of parts in each decimal, e.g., .4 is $\frac{4}{10}$. Ask a student to come to the chalkboard to write these decimals as fractions, e.g., $\frac{6}{10}$, $\frac{3}{10}$, $\frac{9}{10}$.

Repeat this procedure.

3.07.01.02 write whole numbers and tenths as decimals

STRATEGY 1: Prepare and distribute 4 ten-strips and 10 units to each student. Write the following on the chalkboard, e.g., 3 ones + 4 tenths. Say, "Use the squared material to show this number. We may write this as $3\frac{4}{10}$. Who can write this number in another way?" ($3\frac{4}{10} = 3.4$.) Repeat this procedure using other examples.

STRATEGY 2: Prepare two sets of cards, one set with fractions or mixed numbers using tenths, and one set with the corresponding decimal. On the chalkboard draw two columns. Label one Fraction and the other Decimal. Ask a student to come to the chalkboard, choose a fraction card, tape it to the chalkboard under Fraction, find the matching decimal card and tape it to the chalkboard under Decimal, and say each aloud. Repeat this procedure until all of the cards have been used.

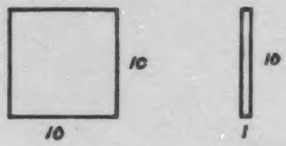
e.g.,

Fraction	Decimal
$\frac{1}{10}$	.1
$2\frac{4}{10}$	2.4

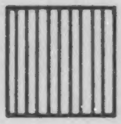
3.07.01

3.07.01.03 count by tenths

STRATEGY 1: Prepare a 10x10 square and 20 strips, 1 inch by 10 inches.
e.g.,



Say, "10 strips are equal to the large square."
e.g.,



Say, "If the large square is equal to one whole, what is the equivalent of each strip?" (.1) Write .1 on the chalkboard. Place the tenth strips in a large bag and ask a student to reach in and take out some strips, e.g., 4 strips. Ask the student to count the strips aloud, e.g., .1, .2, .3, .4. When the student reaches ten strips say, "This equals 1 whole. What will we call eleven strips?" (1.1) Continue this procedure.

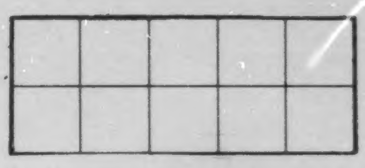
STRATEGY 2: Prepare cards with decimals written on each, e.g., 1.3, .4 . Distribute a handful of cards to a student and ask him/her to count the tenths, e.g., .1, .2, .3, .4... 1.3

P.O. 3.07.01.01

NAME:________________________ CLASS:________ DATE:_______

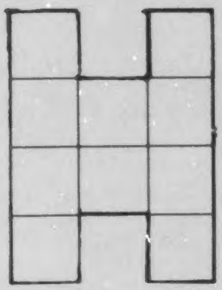
Follow the directions under each figure.

1



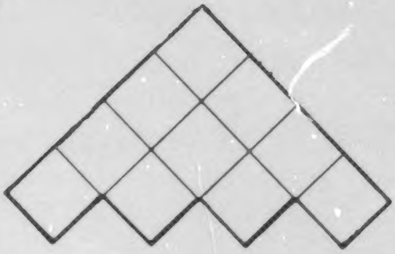
COLOR .2 GREEN

2



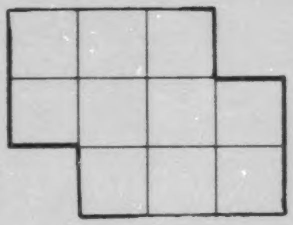
COLOR .7 BLUE

3



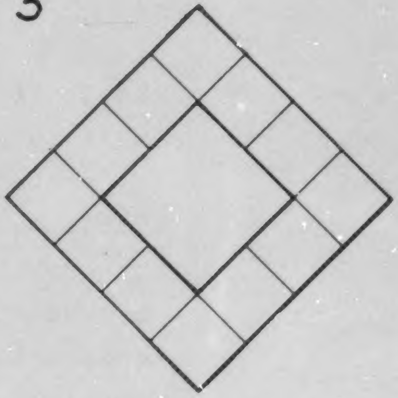
COLOR .4 RED

4



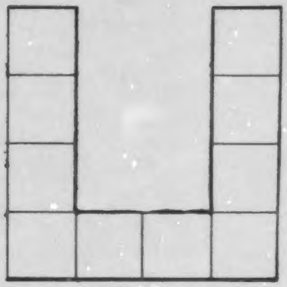
COLOR .9 ORANGE

5



COLOR .5 PURPLE

6

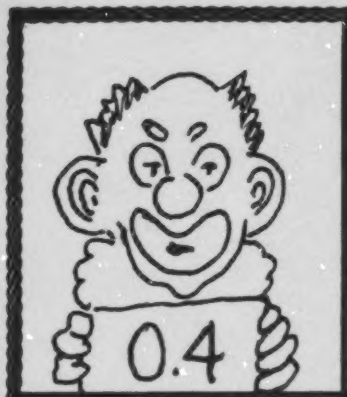


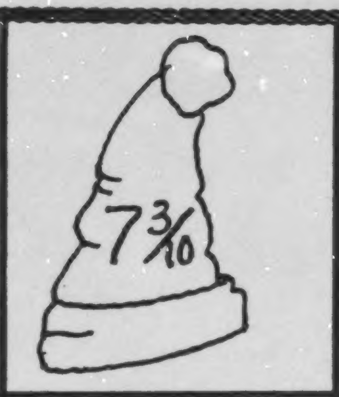
COLOR .8 YELLOW

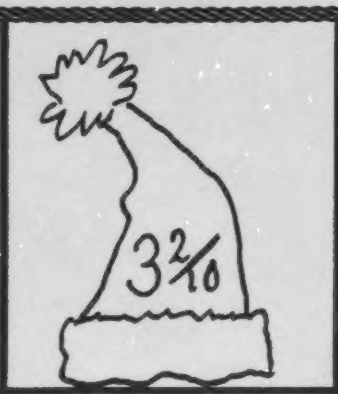
P.O. 3.07.01.02

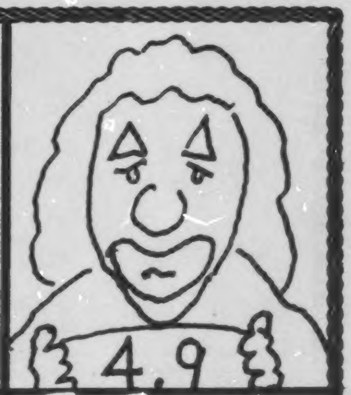
NAME: ______________________ **CLASS:** __________ **DATE:** __________

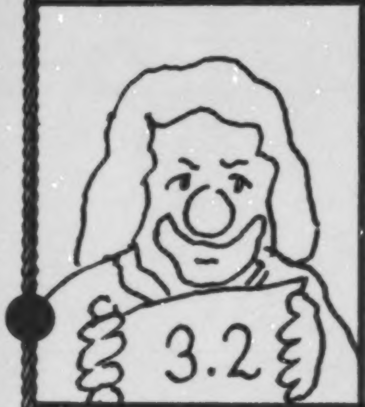
Draw a line from the clown to his matching hat.

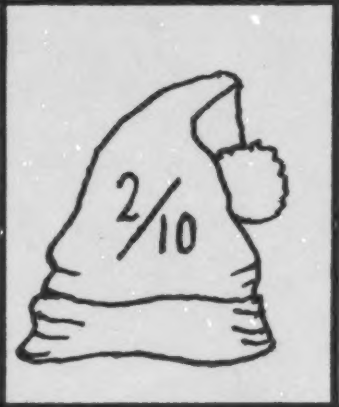


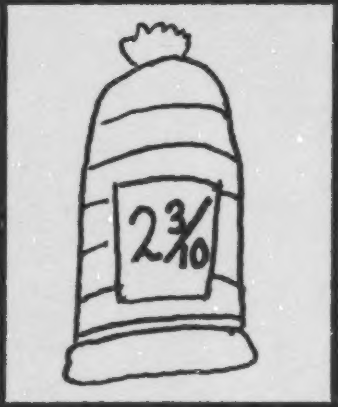


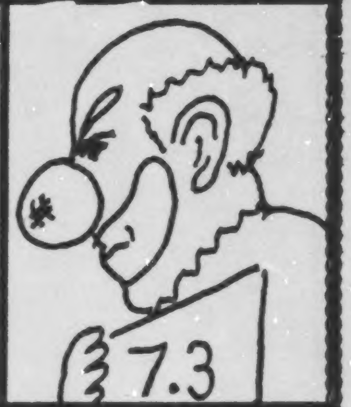


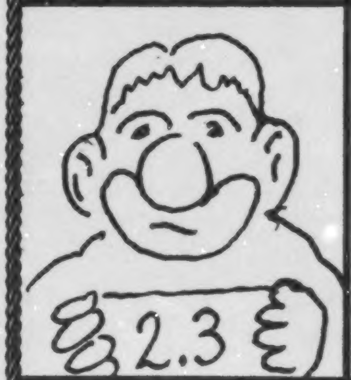


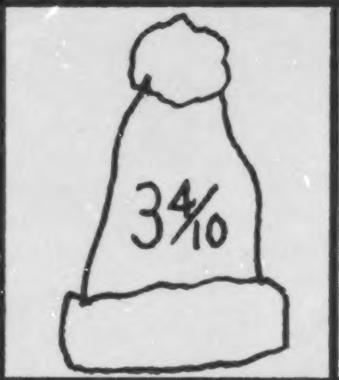


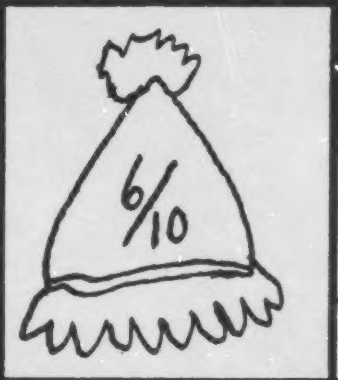


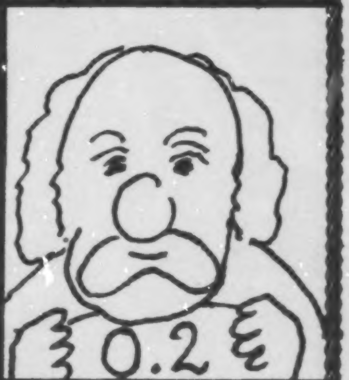


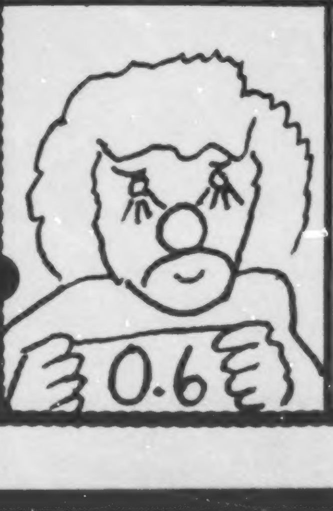


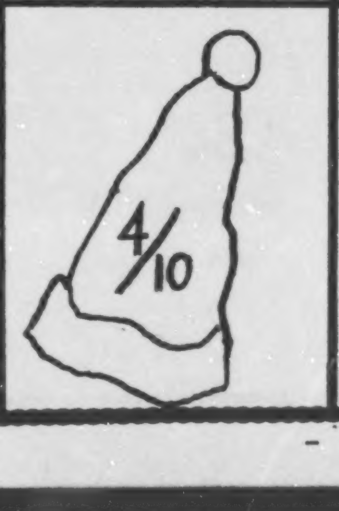


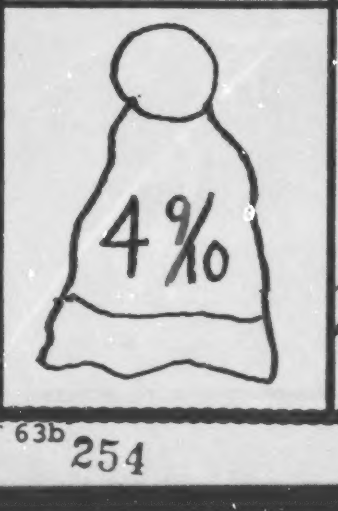


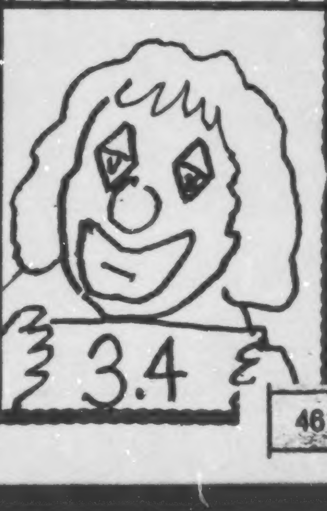








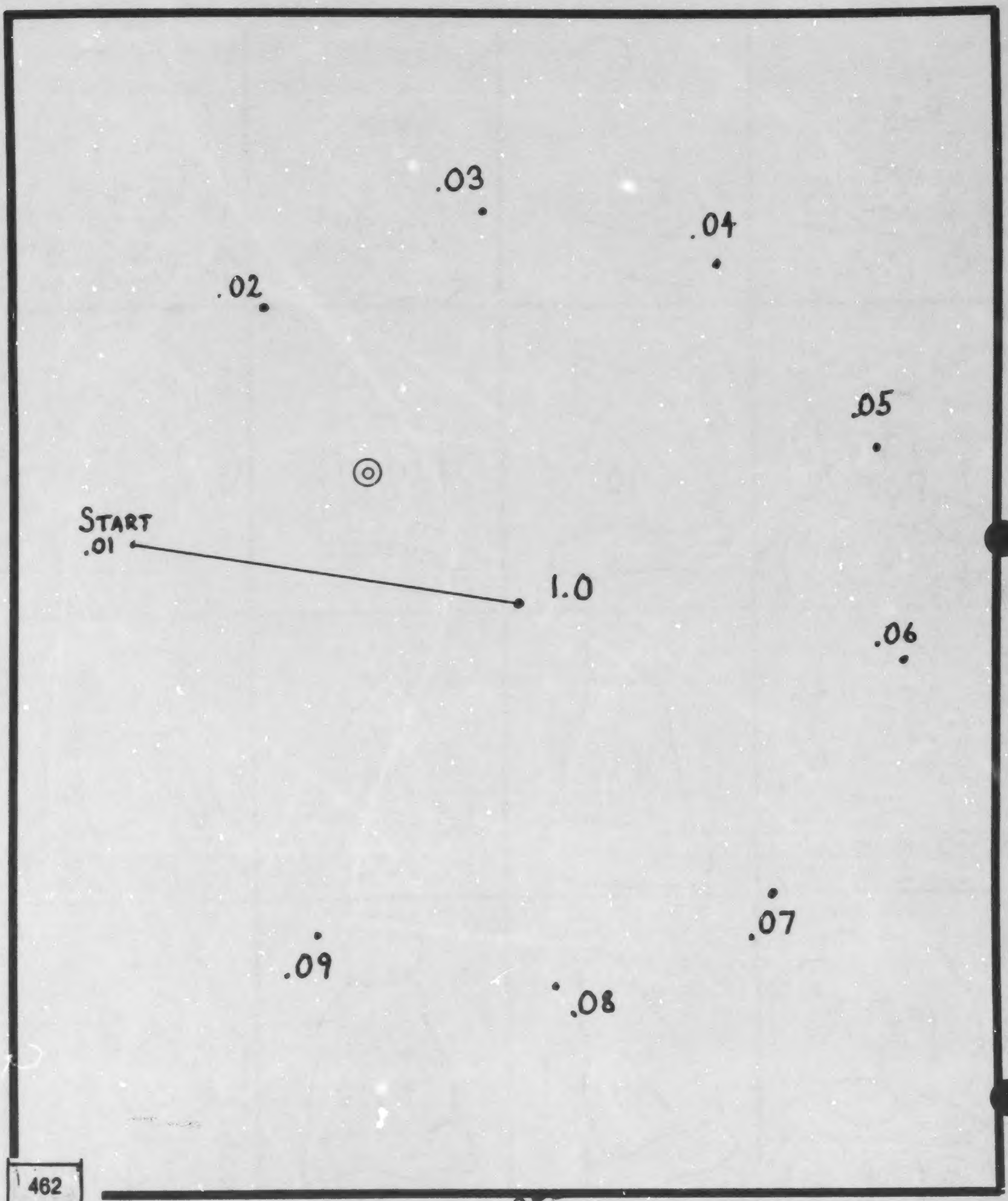




P.O. 3.07.01.03

NAME: ______________________ CLASS: __________ DATE: ________

Count by tenths and connect the dots. Color the picture.


.03
.04
.02
.05
START
.01
1.0
.06
.07
.09
.08

462

3.13.03 CREATE MODELS/CHARTS TO HELP SOLVE PROBLEMS

(1-2 lessons)

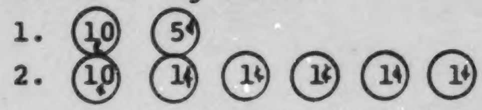
PERFORMANCE OBJECTIVES

The student will be able to...

3.13.03.01A use representative materials to help solve a problem;

e.g.,

How many ways can you show 15 cents using coins?



3.13.03.02A create charts/tables to help solve problems;

e.g.,

How many ways can you show 15 cents using coins?

Dimes	1	1				
Nickels	1		3	2	1	
Pennies		5		5	10	15
Total	15	15	15	15	15	15

3.13.03.03A develop questions based upon information obtained from a model/chart.

e.g.,

1. When do we use all of the same coins?
2. What is the least number of coins?
3. What is the greatest number of coins?
4. Were we able to use all of the coins to make 15 cents?

3.13.03

VOCABULARY

TERMS

chart
table

GETTING STARTED

Divide the class into groups. Prepare and distribute the following materials to each group: 1. a container of counters. 2. a problem sheet for each student with eight short problems. Say, "Each student will have a turn to read and act out a problem using the counters."

e.g.,

Mary had 42 apples and 17 oranges. How many fruits in all?
_______ fruits.

All of the students should write a number sentence and solve each problem.

Say, "What are the steps we use to solve word problems?" Record the steps on the chalkboard.

e.g.,

1. Read the entire problem.
2. Choose important facts.
3. Write a number sentence.
4. Answer the number sentence.
5. Write the answer.
6. Check the answer for reason ableness.

Put a word problem involving one operation with whole numbers on the chalkboard. Ask a student to read the problem. Ask the students to write a number sentence for the problem in their notebook. Say, "How did you arrive at the number sentence for the problem?" Stress the relationship between the question and the number sentence.

3.13.03

3.13.03.01 **use representative materials to help solve a problem**

STRAGEY 1: Divide the class into groups. Prepare and distribute a supply of real or play coins including pennies, nickels, dimes and quarters to each student.

Say, "We are going to be working with problems that may have more than one solution." Write a problem on the chalkboard.

e.g.,

How many ways can you show 15¢ using coins?
Which way has the most coins? the fewest?

Allow the students several minutes to experiment with the coins and record their answers. Ask each group to report their findings.

Repeat this procedure using other examples.

STRATEGY 2: Write the following problem on the chalkboard.

e.g.,

At the farm Jean saw 1 cow, 3 chickens and 4 pigs. How many legs did Jean see? tails? ears?

Prepare and distribute counters in three different colors. Ask a student to read the problem. Say, "Let the yellow counters represent legs, the blue counters represent tails and the red counters represent ears. How many legs does a cow have? (4) A chicken? (2) A pig? (4) How many cows were at the farm? (1) chickens? (3) Pigs?" (4) Ask the student to use 4 yellow counters to represent the cow, 6 yellow counters to represent the 3 chickens and 16 yellow counters to represent the 4 pigs. Say, "Now we add all of the counters to find out how many legs in all." Continue this prcoedure for tails and ears.

3.13.03

3.13.03.02 create charts/tables to help solve problems

STRATEGY 1: Write the following problem on the chalkboard.

> How many ways can you show 20¢ using dimes, nickels and pennies?

Say, "One way to find a solution to this problem would be to use coins. There is another way. We are going to draw a chart and use the information to help solve the problem." Draw the following chart.

e.g.,

Dimes (10¢)	Nickels (5¢)	Pennies (1¢)	Total
			20

Say, "The total in each row must always be 20." Copy the problem and the chart. Ask a few students to give answers and write them on the chalkboard. Repeat this procedure using different sums of money.

STRATEGY 2: Say, "Charts are a good way to help solve problems. We are going to draw and label a chart that goes with this problem." Write the following problem on the chalkboard.

> It takes two cans of paint to paint one room. How many cans of paint will it take to paint two rooms? three rooms? four rooms? ten rooms?

Say, "The chart must include the number of cans and the number of rooms." Draw the chart on the chalkboard.

e.g.,

Rooms	Cans
1	2
2	

Ask students to come to the chalkboard to fill in the chart. Repeat this procedure with other problems and charts.

3.13.03.03 develop questions based upon information obtained from a model/chart

STRATEGY 1: Divide the class into groups. Prepare and distribute to each group a supply of play money including pennies, nickels, dimes and quarters.

Write the following information on the chalkboard. e.g.,

2 dimes + 4 pennies = 24¢
1 dime + 2 nickels + 4 pennies = 24¢
4 nickels + 4 pennies = 24¢

Say, "Using this information and the play money, write six questions about this information." Allow the students time to write the questions and then collect the results. Read one question aloud. Say, "Can we answer this question using the information from the chart and the coins? Enough information must be given to be able to answer the question." Repeat this procedure using other student questions.

STRATEGY 2: Write the following chart on the chalkboard. e.g.,

Item	Cost for 1	Cost for 2	Cost for 3
apple	20¢	40¢	60¢
orange	17¢	34¢	51¢
banana	25¢	50¢	75¢
grapefruit	32¢	64¢	96¢

Say, "Use the above chart and write three questions as follows."

1 question for addition
1 question for subtraction
1 question for multiplication

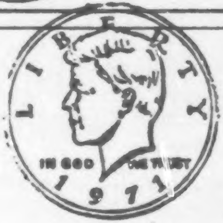
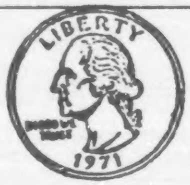
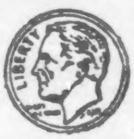
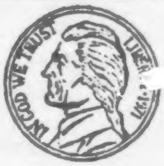
Continue this procedure using other charts.

P.O. 3.13.03.01

NAME: ______________________ CLASS: __________ DATE: __________

How many ways can you show 50¢ without using pennies.

How many ways can you show 50¢ without using pennies?

 50¢	 25¢	 10¢	 5¢
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

P.O. 3.13.03.02

NAME: ______________________ CLASS: __________ DATE: ________

Read and solve each problem.
Use another sheet for your charts if you have more space.

1. Fill in a chart like the one below to help you find how many ways you can make 25¢ using dimes, nickels, and pennies.

Dimes				
Nickles				
Pennies				
Total				

2. Using a similar chart, show how many ways you can show 35¢.

3. Draw a chart to solve. If 1 rabbit can run 50 miles and 2 rabbits can run 100 miles. How many miles can 15 rabbits run? 22 rabbits?

4. The book store is having a sale. The books are packaged in bundles of 3. Complete the table below to find the cost of 9 books, 12 books and 15 books.

Books	3	6	9	12	15
Price	$2.15	$5.10			

5. Set up a table to show how much 3 oranges would cost if 18 cost $1.20 and 15 cost $1.00.

6.

JULY						
Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
						5
				31		

1. Fill in the missing days.
2. On what day will August 1 be?
3. What date is 2 weeks after July 6?
4. What day was June 30?

P.O. 3.13.03.03

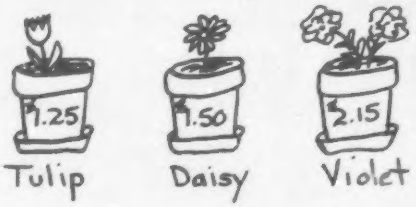
NAME:______________________ CLASS:__________ DATE:________

Write 2 questions for each set of information or chart.

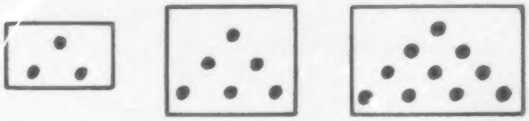
number of apples	1	3	5	8	
cost	20¢	60¢	$1.00	$1.60	

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

We saw 4 bears, 17 ducks and 6 lions at the zoo.



Pennies	5	0	0	0
Nickels	5	10	6	4
Dimes	2	0	2	3
Total	50	50	50	50



Unit 56

3.10.08 CAPACITY-METRIC

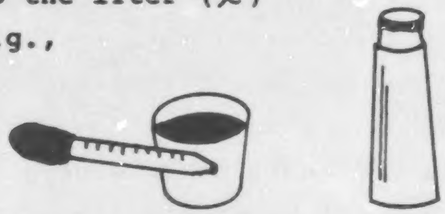
(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.10.08.01B identify and compare the milliliter (mℓ) to the liter (ℓ)

e.g.,



1000 milliliters = 1 liter
(mℓ) (ℓ)

3.10.08.02B identify equivalent metric units of capacity.

e.g.,

1 liter = 100 centiliters
1 liter = 1000 milliliters
1 kiloliter = 1000 liters

3.10.08

VOCABULARY

TERMS	SYMBOLS
milliliter	mℓ
liter	ℓ
kiloliter	kℓ
capacity	

GETTING STARTED

Display a large container. Prepare 10 to 15 cups filled with water and have them standing next to the container. Say, "How many cups of water do you think it will take to fill this container?" Record students' estimates on the chalkboard. Pour the cups of water into the container one at a time. Ask a student to count the number of cups used to fill the container. Circle the correct estimate on the chalkboard. Say, "When we try to find out how much something can hold, we are measuring its capacity. Capacity is how much something can hold. How many cups of water were needed to fill this container? The capacity of this container is ____ cups." Repeat this procedure using containers of varied sizes.

Prepare and display several empty soda bottles, liquid detergent bottles, milk and juice containers. Ask a student to read the label on one of the containers to determine its capacity, e.g., 1 liter. Repeat this procedure until all of the containers have been identified by capacity. Ask, "Which container holds the most liquid? The least liquid? Which container would you buy if two people lived in your house? Nine people?"

3.10.08

3.10.08.01 **identify and compare the milliliter (mℓ) to the liter (ℓ)**

STRATEGY 1: Display a liter container and centimeter cubes in groups of one hundred at the front of the room. Divide the class into groups of four. Say, "We want to find out how many cubes will fill the container." Ask a group of students to line up the cubes inside the container. Say, "Did this set of cubes fill the container?" (No) Write the number 100 on the chalkboard. Repeat this procedure until the liter container has been filled to capacity. Ask a student to add the groups of 100. Say, "It took a thousand cubes to fill the container. In metric measurement, the name used for liquid measurement is liter." Write the word liter on the chalkboard. Say, "This container represents one liter." Hold up one cube and say, "This cube is equal to one milliliter. How many milliliters did it take to fill up the liter container?" (1000) Write on the chalkboard, 1000 milliliters (mℓ) = 1 liter. Repeat this procedure using other examples.

STRATEGY 2: Prepare a plastic liter container, an eyedropper, 2 empty cups and a cup of water. Label one cup 100 milliliters. Fill the eyedropper with 10 drops of water. Empty the contents of the eyedropper into one empty cup. Say, "The ten drops are equal to about 1 milliliter of water." Repeat this procedure nine more times. Say, "The cup contains 10 milliliters of water." Mark the side of the cup and pour the 10 milliliters of water into the empty cup. Say, "How many more groups of ten milliliters must we add so that the second cup contains 100

266

STRATEGY 2: cont'd

milliliters?" (9) Repeat this procedure until the cup contains 100 milliliters. Mark the cup at the 100 milliliter line. Say, "We will pour the water into the liter container. Let's see how many more 100 milliliters we need to fill the container." Repeat this procedure, recording the amount used until the liter container is filled. Say, "How many milliliters did it take to fill the cup?" (1 liter = 1000 milliliters.)

3.10.08.02 identify equivalent metric units of capacity

STRATEGY 1:

Draw accurate representations of the following metric units of capacity on the chalkboard, milliliter, centiliter, liter and kiloliter. Do not label the diagrams. Write the names of each metric unit on a separate piece of paper and on the reverse side write a description of each unit. Display the cards on the chalkboard. Ask the students to come to the chalkboard and read a card. e.g.,

Liter	The basic metric unit of liquid measure. A liter is equal to a little more than a quart.

Say, "Can you match the card to the drawings at the chalkboard? Which unit is the largest? smallest? Which unit would be used to measure a bottle of milk? a glass of water?"

Write the equivalent metric units of capacity on the chalkboard.
e.g.,

1 liter = 100 centiliters
1 liter = 1000 milliliters
1 kiloliter = 1000 liters

STRATEGY 2: Display a liter container. Say, "This container represents 1 liter. The liter is the basic metric unit of liquid measure." Fill an eyedropper with water. Empty the dropper. Say, "This amount of water is equal to 1 milliliter. How many milliliters will it take to fill the liter container?" (1000 milliliters) Write the following on the chalkboard, 1 liter = 1000 milliliters.

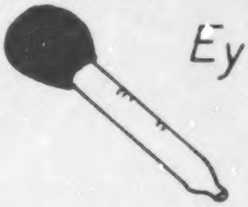
Fill a centiliter container with water. Say, "This is a centiliter of water. What is the difference between a centiliter and a milliliter?" (centiliter is larger) Say, "How many centiliters do you think it would take to fill the liter container?" (1 liter = 100 centiliters.) Use the centiliter container to fill a liter container.

Point to the liter container. Say, "Imagine 1000 of those containers together. 1000 liter containers are equal to 1 kiloliter." Write on the chalkboard, 1 kiloliter = 1000 liters.

P.O. 3.10.08.01

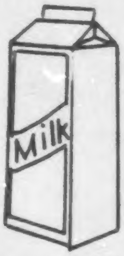
NAME:____ CLASS:__________ DATE:________

Circle the unit you would use to find how much liquid is in each container.



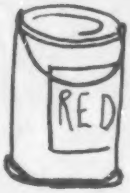
Eye dropper

milliliter liter

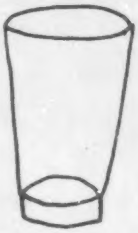


milliliter liter

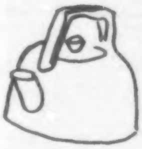
Paint



milliliter liter

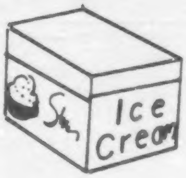


milliliter liter

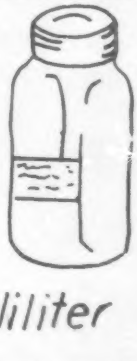


Coffee pot

milliliter liter

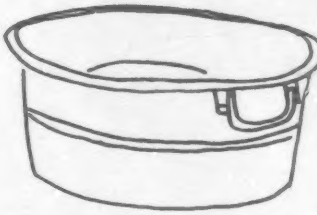


milliliter liter



Medicine

milliliter liter



Basin

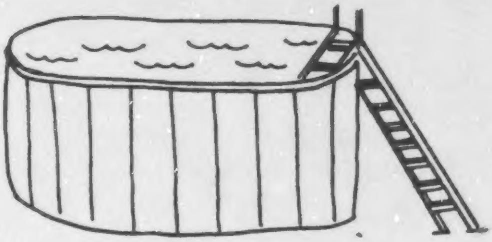
milliter liter

P.O. 3.10.08.02

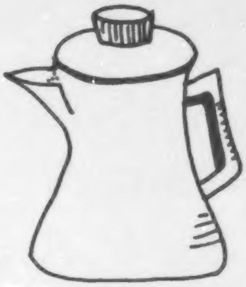
NAME:____CLASS:_________DATE:_______

I. Draw a line from the picture to the unit you would use to measure each item.

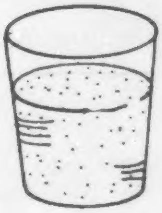
II. Fill in the blanks.



milliliters



kiloliters



liters

Fill in the blanks

1 liter = ____ centiliters

___ liter = 1000 milliliters

1 kiloliter = 1000 ________

3.01.04 COUNT BY TWOS, THREES, FOURS, FIVES

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.01.04.01A	count by twos forward and backward within the hundreds; e.g., 100, 102, 104, ..., 200 500, 498, 496, ..., 400
3.01.04.02A	count by fives forward and backward within the hundreds; e.g., 400, 405, 410, ..., 500 300, 295, 290, ..., 200
3.01.04.03A	count by threes forward and backward within the hundreds; e.g., 600, 603, 606, 609, ..., 699 699, 696, 693, 690, ..., 600
3.01.04.04A	count by fours forward and backward within the hundreds. e.g., 100, 104, 108, 112, ..., 200 200, 196, 192, 188, ..., 100

3.01.04

VOCABULARY

TERMS

forward
backward

GETTING STARTED

Select 16 students and ask them to form two lines, eight girls on one, eight boys on the other. Say, "We are going to count these students by twos." Ask one boy and one girl to come forward. Ask a student to begin counting by twos, continuing as each set of students comes forward. After all the students have been counted, ask the students to return to their original position. Select a student to count backwards by twos as each set of students comes forward. Call upon a student to continue counting forward by twos through 100. Ask another student to count backward by twos starting at 100.

Divide the students into pairs. Distribute bags of 100 counters (buttons, beads, beans, ...) to each pair of students. Say, "One student will count the items by threes while the other student records the numbers on a piece of paper." Ask the students to change roles and count the items by fours, recording the numbers on paper. Repeat this procedure counting by fives, recording the numbers.

3.01.04

3.01.04.01 **count by twos forward and backward within the hundreds**

STRATEGY 1: Prepare and tape to the chalkboard an enlargement of a piece of graph paper numbered to 200. Prepare and distribute a piece of graph paper to each student and ask him/her to number each box up to 200. Ask students to count aloud by twos through 100 changing students every ten numbers. Ask the students to circle each number on their papers as it is called. Circle the number on the enlargement on the chalkboard.

Vary this procedure by starting with 200 and asking various students to count backward to 100 by twos, circling the numbers as they are said. Demonstrate at the chalkboard as the students do the work at their seats.

STRATEGY 2: Construct a set of even numbered cards from 100 to 200, e.g., 102, 104, 106. Distribute 15 consecutively numbered cards to 15 students. Ask one student to be a recorder. Say, "This game is called Neighbors." Ask a student to come to the front of the room and show his/her card while saying, e.g., "I am 152. Who are my neighbors?" The students holding the even numbers before and after 152 are asked to come to the front of the room and position themselves in order. The recorder now writes the series of numbers on the board, e.g., 150, 152, 154. Ask a student to read the series of numbers backwards. Repeat this procedure to continue the game using 15 other consecutively even numbered cards.

3.01.04

3.01.04.02 **count by fives forward and backward within the hundreds**

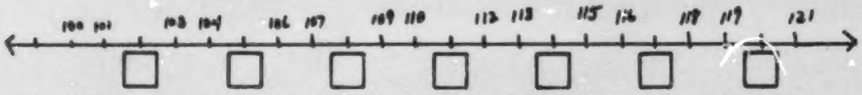
STRATEGY 1: Distribute a sheet of one inch square graph paper to each student. Ask them to number across the top line from 101 through 110 putting one number in each box. Continue the numbering, putting ten numbers across each line up to 200. Ask the students to count five boxes, and circle every fifth number. Call upon different students to read the numbers that are circled. Write the numbers on the chalkboard. Say "Do you see any pattern in the numbers?" Elicit that 0 or 5 appears in the ones column. Ask a student to underline the pattern in the ones column at the chalkboard, and the other students to do it on the graph paper.

STRATEGY 2: Adapt Strategy 1 used in P.O. 3.01.04.01 for counting by fives.

3.01.04.03 **count by threes forward and backward within the hundreds**

STRATEGY 1: Adapt Strategy 1 used in P.O. 3.01.04.01 for counting by threes.

STRATEGY 2: Draw a number line on the chalkboard starting at 100 and going to 120. Put squares under every third line.



Ask a student to come to the chalkboard and place the missing numbers in the squares. Ask another

STRATEGY 2: cont'd

student to say the numbers written in the squares, e.g., 102,105,108,....

Repeat this procedure twice using a number lines starting at 400 and at 700.

3.01.04.04 **count by fours forward and backward within the hundreds**

STRATEGY 1: Adapt Strategy 1 used in P.O. 3.01.04.01 for counting by fours.

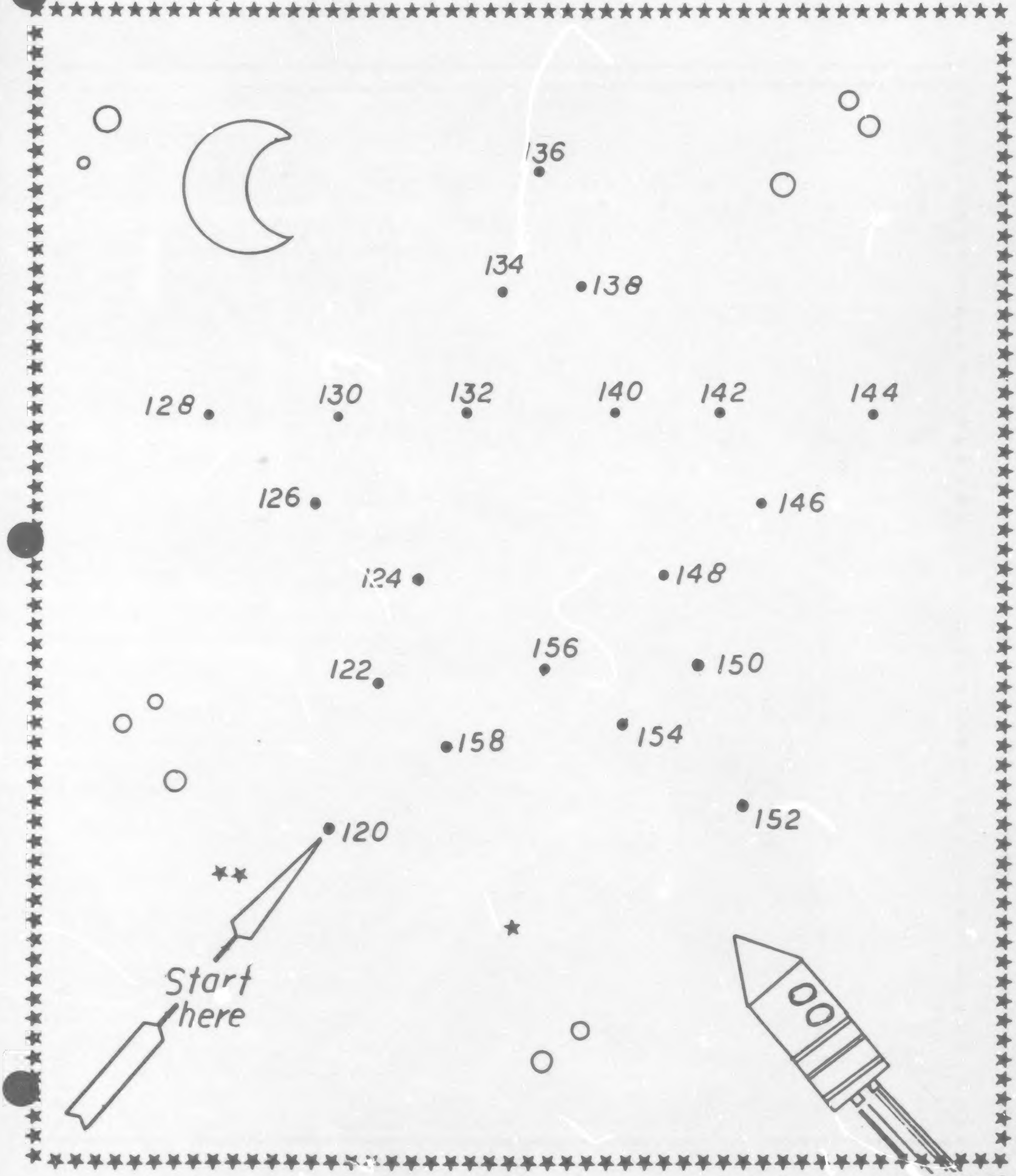
STRATEGY 2: Play a game called "BUZZ". Starting with the first student, each student says a number in sequential order. When a student reaches a number which is a multiple of 4, he/she says "BUZZ" instead of the number, e.g., 201,202,203, BUZZ... or 245,246,247, BUZZ... If the student misses, he/she is out. The game continues until there is a winner.

Repeat the game using 300, 500, etc.

P.O. 3.01.04.01

NAME: ______________________________ CLASS: ________ DATE: _______

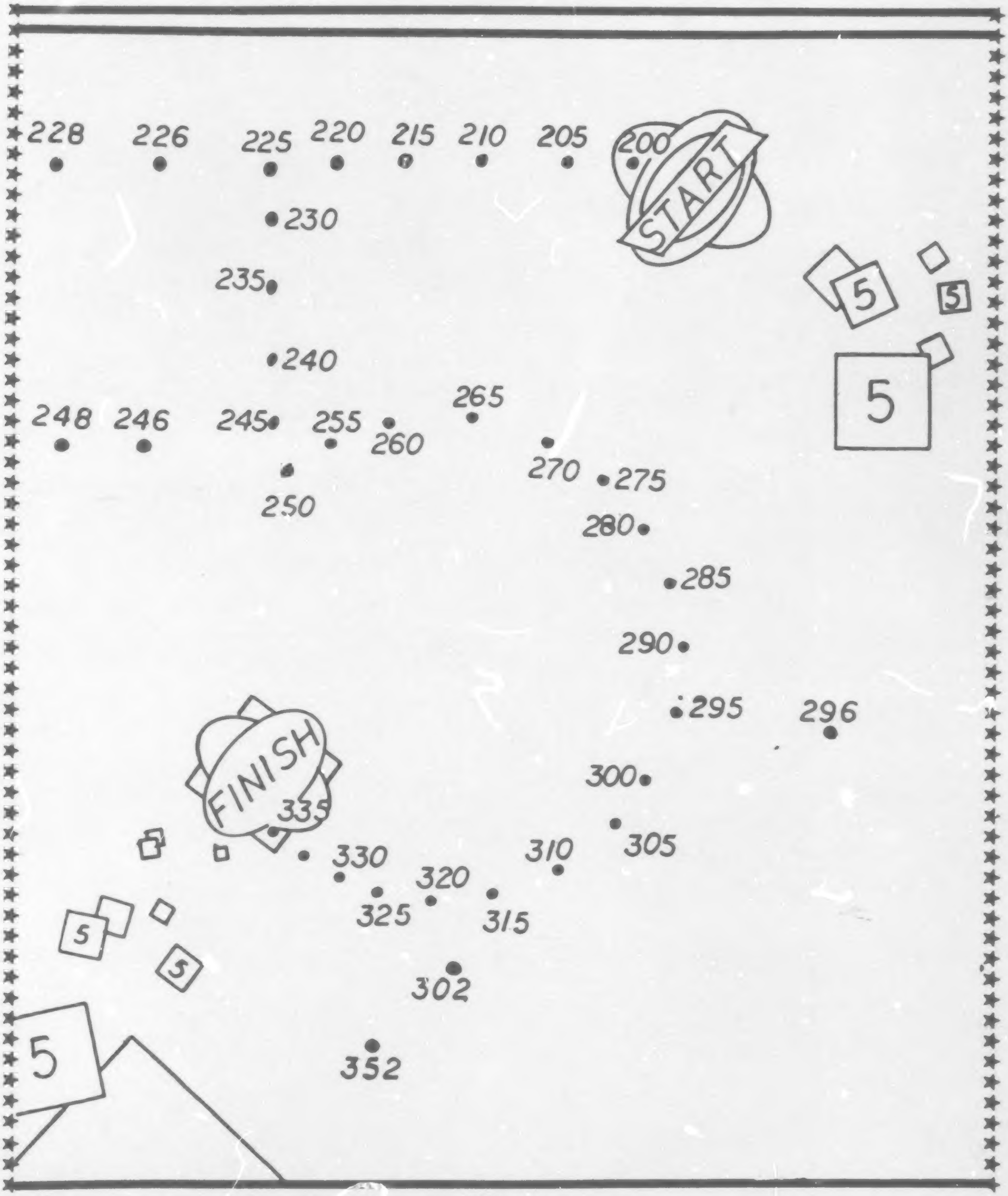
Connect the dots counting by two to see the picture.


136
134
138
128
130
132
140
142
144
126
146
124
148
156
122
150
158
154
120
152
Start here

P.O. 3.01.04.02

NAME:______________________________________CLASS:_________DATE:________

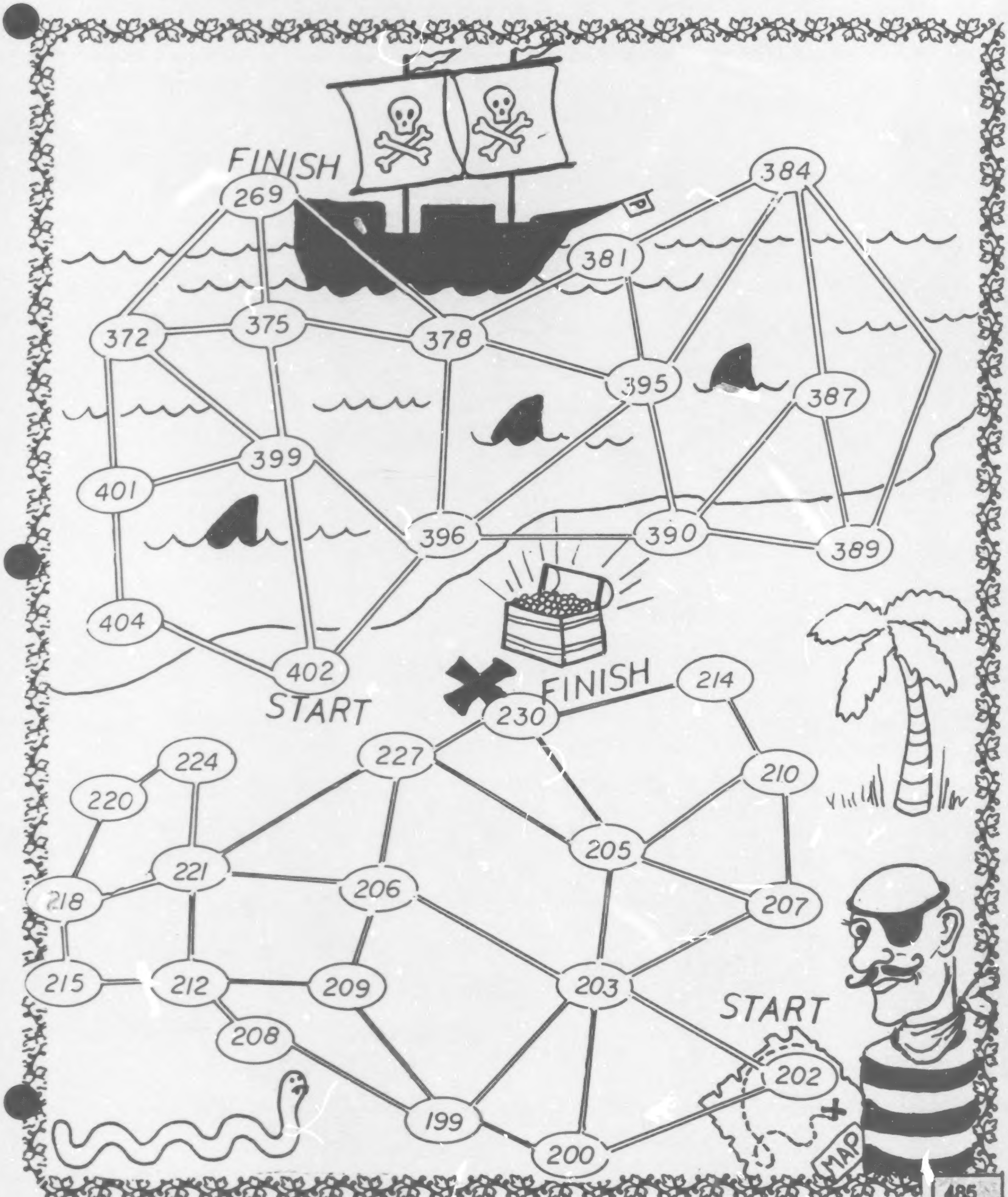
Connect the dots counting by fives.


228
226
225
220
215
210
205
200
START
230
235
240
265
248
246
245
255
260
270
275
250
280
285
290
295
296
300
305
310
315
320
325
330
335
FINISH
302
352
5
5
5
5
5
5

P.O. 3.01.04.03

NAME:____ CLASS:__________ DATE:__________

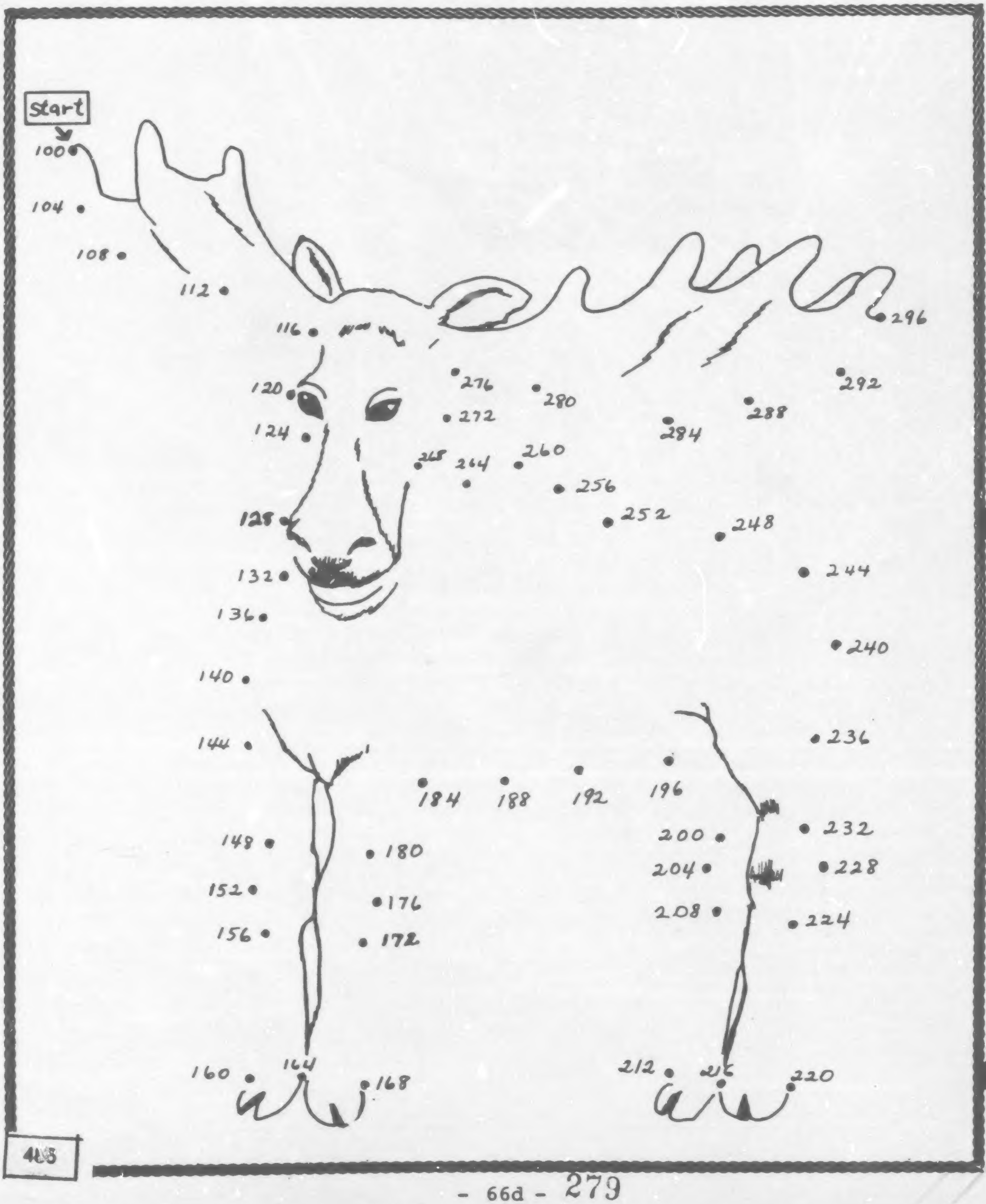
To help the pirate find the treasure count forwards by three.
To help him carry it to his ship count backward by three.


FINISH
269
384
381
372
375
378
395
387
399
401
396
390
389
404
402
START
FINISH
214
230
227
224
220
210
221
205
218
206
207
215
212
209
203
START
208
202
199
200
MAP

P.O. 3.01.04.04

NAME:______________________________CLASS:________DATE:________

Start at 100 and connect the dots counting by fours.


Start
100
104
108
112
116
120
124
128
132
136
140
144
148
152
156
160
164
168
172
176
180
184
188
192
196
200
204
208
212
216
220
224
228
232
236
240
244
248
252
256
260
264
268
272
276
280
284
288
292
296

3.01.05 ORDER NUMBERS UP TO 4-DIGIT NUMBERS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.01.05.01A	order 3-digit numbers in both increasing and decreasing orders; e.g., 314, 341, 143 in increasing order: 143, 314, 341 314, 341, 143 in decreasing order: 341, 314, 143
3.01.05.02B	order 4-digit numbers. e.g., 4,328, 3,284, 2,843, is ordered to 2,843, 3,284, 4,328 from smallest to largest.

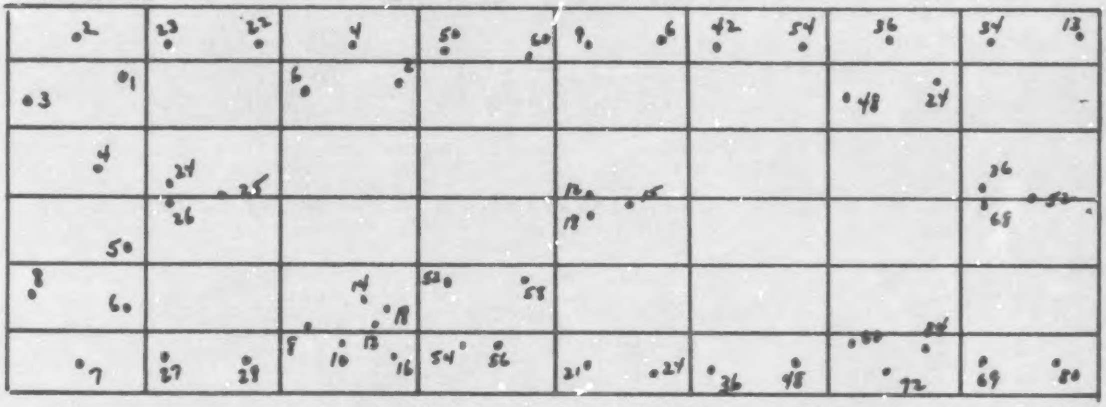
VOCABULARY

TERMS

sequence
increasing
decreasing
ascending
descending

GETTING STARTED

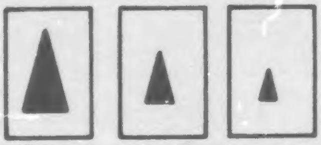
I. Display the following on the chalkboard.



Say, "Who can connect the first set of dots?... What letter did you make?" Repeat the procedure for each set.

Say, "Who can tell us what sequence means? Sequence is the coming of one thing after another."

Prepare sets of shapes in three different sizes drawn on separate index cards.
e.g.,



Mix the cards and ask students to place the shapes in size order from the smallest to the largest and from the largest to the smallest.

3.01.05

3.01.05.01 **order 3-digit numbers in both increasing and decreasing orders**

STRATEGY 1: Prepare and distribute squared material to each student. Say, "Using your squared material make the number 243. How many hundreds? (2) tens? ones? Next, let's make the number 342. How many hundreds? tens? ones? Last, let's make the number 432. How many hundreds? tens? ones? Which number is the smallest? largest? When we put numbers in order from the smallest to the largest, we say we are putting them in increasing order. When we put numbers in order from the largest to the smallest, we say we are putting them in decreasing order."

Place series of numbers on the chalkboard and ask the students to place them in increasing and decreasing order.

STRATEGY 2: Write the following numbers on the chalkboard, 314, 341, 143. Ask a student to come to the chalkboard and circle the digit that is in the hundreds place. Say, "Which of these three numbers has the greatest number of hundreds?" (2 are the same.) Ask a student to circle the digit that is in the tens place. Say, "Which of these numbers has the largest number of tens?" (2 are the same.) Point to 341 and 314 and say, "Which of these numbers has the greatest value? (341) Why? (more tens) 341 is our greatest number, 314 is next and 143 is the smallest. We have just placed these numbers in decreasing order from the largest to the smallest." Write 143, 314 and 341 on the chalkboard. Say, "Now the numbers are in increasing order. We ordered them from the smallest to the largest. First we look at the hundreds place to determine

STRATEGY 2: cont'd

the greatest value. If two numbers are the same, we must look at the tens place or even the ones place."

Continue this procedure using other numbers.

3.01.05.02 **order 4-digit numbers**

STRATEGY 1: Prepare a place value pocket chart and 4 packs of cards numbered from 0 through 9. Ask a student to come to the front and select 4 cards and randomly place them in the chart.

e.g.,

Th	H	T	O
6	8	3	1

Ask two more students to do the same. The chart will now look like this.

e.g.,

Th	H	T	O
6	8	3	7
9	4	3	1
4	9	3	1

Say, "Which number is the smallest? How do you know? (smallest digit in the thousands place) What number is next? the largest?" Write the numbers on the chalkboard in ascending order, e.g., 4,931, 6,837 and 9,431. Say, "We placed these numbers in order from the smallest to the largest. If we reversed the order, we order them from the largest to the smallest (descending order). e.g., 9,431, 6,837, 4,931.

STRATEGY 2: Adapt Strategy 1 used in P.O. 3.01.05.01.

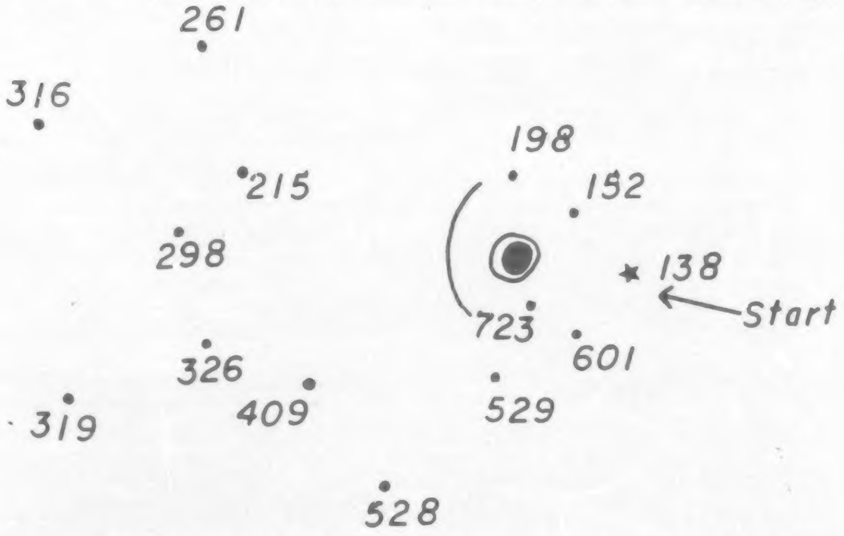
P.O. 3.01.05.01

NAME: ____________________ CLASS: ________ DATE: ________

I. Place these numbers in increasing numerical order.
II. Place these numbers in decreasing numerical order.
III. Connect the dots in increasing order.

A	287	412	356	747	123
	____	____	____	____	____
B	439	652	837	258	394
	____	____	____	____	____
C	187	307	287	145	302
	____	____	____	____	____

A	427	359	782	941	123
	____	____	____	____	____
B	296	458	979	148	723
	____	____	____	____	____

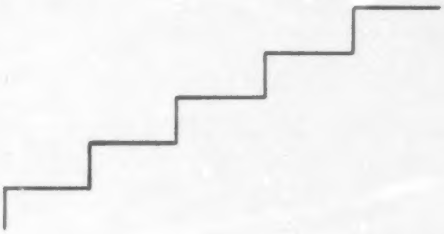

261
316
198
215
152
298
138
Start
723
601
326
409
319
529
528

P.O. 3.01.05.02

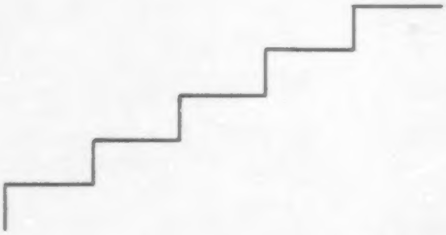
NAME: ______________________ CLASS: ________ DATE: ________

I. and II. Write these numbers in ascending order.
III. and IV. Write these numbers in descending order.

I



3,621 6,832 4,978 5,329 2,461



4,821 4,782 4,394 4,936 4,073

II

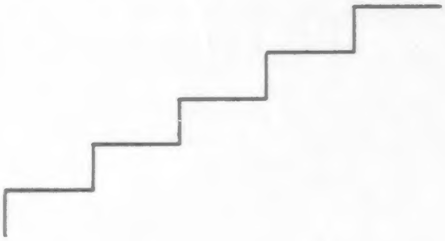
______ ______ ______ ______ ______

3,724 3,742 3,786 3,768 3,704

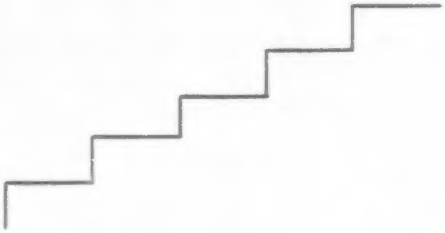
______ ______ ______ ______ ______

6,324 6,328 6,329 6,320 6,325

III



3,238 6,427 2,478 6,042 3,230



5,827 8,572 7,582 2,875 9,825

IV

______ ______ ______ ______ ______

3,947 3,974 3,982 3,904 3,912

______ ______ ______ ______ ______

4,683 8,739 4,680 8,732 4,682

3.01.06 NEGATIVE NUMBERS

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.01.06.01B identify the negative (-) sign for numbers and use negative numbers in real life situations;

e.g.,

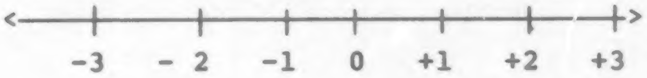
-6 is negative six

above and below zero

elevator levels above and below ground

3.01.06.02B locate the points for the negative numbers on a number line.

e.g.,



3.01.06

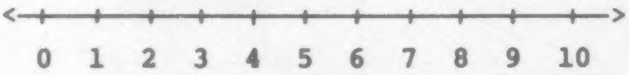
VOCABULARY

TERMS	SYMBOLS
postive number	+
negative number	-
degree	°

GETTING STARTED

Number index cards from zero through the total register of your class plus one (1) additional card. Distribute one (1) card to each student. Ask one student to stand and show his/her number to the class. The students whose cards have numbers which come before and after that number card are to stand. The three (3) students are then to line up in sequence. Ask another student to read the three (3) numbers in counting order. Continue until every student has had a turn.

Draw a number line on the chalkboard. Label it from 0 to 10. Ask students to come to the chalkboard and point to the location of the number that comes after two, five, ..., and before three, six, ... e.g.,



3.01.06

3.01.06.01 **identify the negative (-) sign for numbers and use negative numbers in real life situations**

STRATEGY 1: Draw a thermometer (a vertical number line) on the chalkboard. Label the number line from -10 through +20. Be sure to mark 0. Say, "One day in January it was 10°." Ask a student to come to the chalkboard and point to 10° on the thermometer. Mark that point with colored chalk. Say, "The next day the thermometer dropped to -5°." Ask a student to point to -5° on the thermometer. Mark that point with colored chalk. Repeat this procedure using other temperatures, e.g., 12° -7°, -8°, 14°.... Ask which days would be the coldest. Why? Say, "Which is colder 0° or -4°? What do we notice about all the negative temperatures?" (They are below zero.)

STRATEGY 2: Draw an elevator push button panel on the chalkboard. Number it vertically from +20 to -5. Distribute identical diagrams to the class. Point out the number buttons on the panel as you say, "Which button should you push to get to the 3 floor? 8 floor? -2 floor? 0 floor?" Direct the students to circle each button as you say the floor number. Ask which would be the lowest floor. Why? Say, "Any floor below zero is below ground level and is shown by negative numbers. Which floors are below ground level? Place an X on the negative numbers which represent them."

3.01.06.02 **locate the points for the negative numbers on a number line**

STRATEGY 1: Say, "A boy once found $10.00." Write on the chalkboard a gain of $10.00. Say, "Then he lost the $10.00." Write a loss of $10.00 on the chalkboard. Say, "How can the two amounts be written so as to be distinguishable." (+$10.00 and -$10.00)

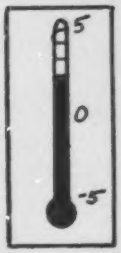
Draw a number line with points -20 through + 20 indicated but unlabeled. Label the zero. Ask a student to come to the chalkboard to find the +10, to indicate the $10.00 gain and label it. Ask another student to come to the chalkboard to find the -10, to indicate the $10.00 loss, and label it. Repeat this procedure using other examples until the entire number line is labeled.

STRATEGY 2: Adapt Strategy #1 used in P.O. 3.01.06.01 for locating negative numbers.

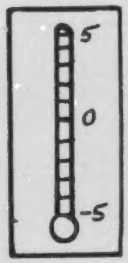
P.O. 3.01.06.01

NAME: ____________________ CLASS: __________ DATE: __________

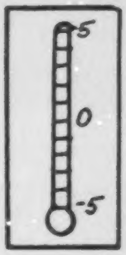
Read the temperature next to each thermometer.
Color in each thermometer to show the temperature.
The first one is done for you. Note: +3° is read as 3 degrees.



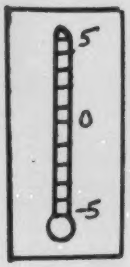
+2°



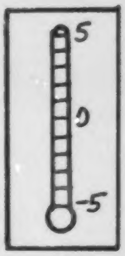
-3°



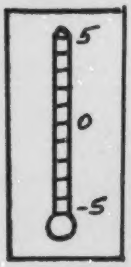
-2°



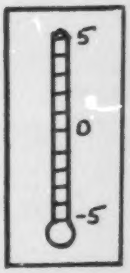
-4°



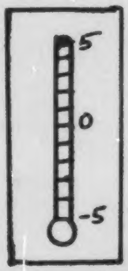
+5°



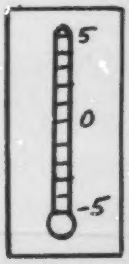
+3°



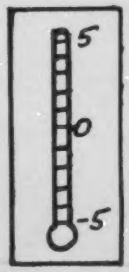
-5°



+4°



0°

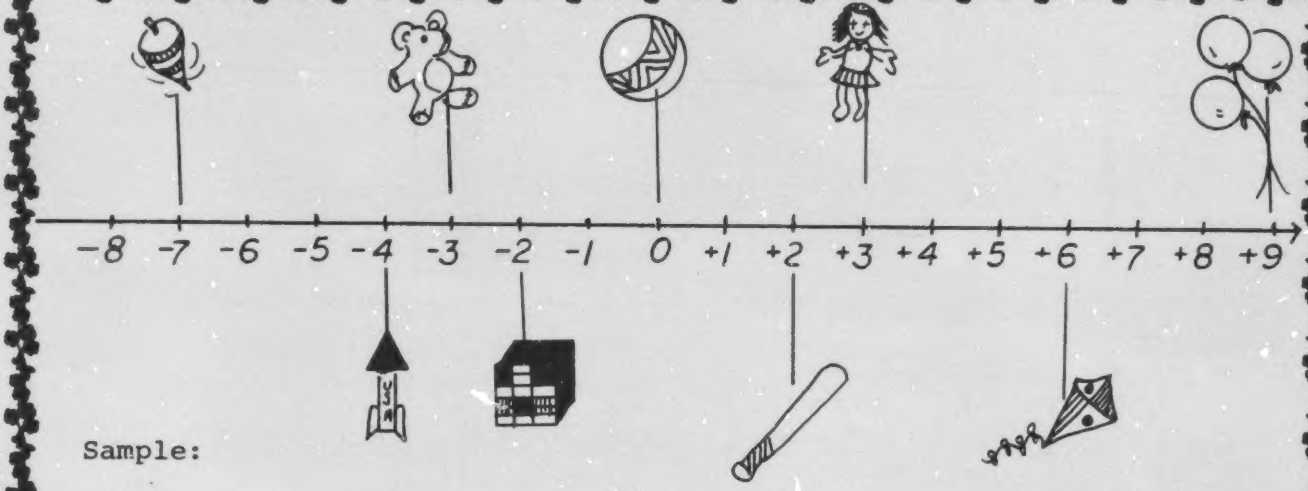


-1°

P.O. 3.01.06.02

NAME: ______________________ CLASS: ________ DATE: ________

Which toy does each child get?
Locate the point on the number line and you will find out.
The first one is done for you.



Sample:

Jerry's special number is -3. His toy is a teddy bear.

1. Peter's special number is -4. His toy is ____________.
2. Carol's special number is +3. Her toy is ____________.
3. Vanessa's special number is -7 Her toy is ____________.
4. Kareem's special number is +2 His toy is ____________.
5. Juan's special number is -2. His toy is ____________.
6. Fran's special number is 9. Her toy is ____________.
7. Billy's special number is 0. His toy is ____________.
8. Carlos' special number is +6. His toy is ____________.

3.01.07 ROMAN NUMERALS

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.01.07.01B identify and write Roman numerals from XIII through XXXIX (13 through 39); e.g.,

20 = XX

39 = XXXIX

3.01.07.02B solve word problems related to skills learned in this module. e.g.,

John read XIII pages in his book. The last page in the book is XXXII. How many more pages does John have to read to finish the book?

XXXII - XIII = XIX pages

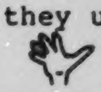
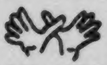
3.01.07

VOCABULARY

SYMBOLS

I
V
X

GETTING STARTED

Tell the following story: "Long ago in the days of the Roman Empire, the Romans used special symbols to represent their numbers. For the number 1 they used 1 finger, for 2 they used 2 fingers and for 3 they used 3 fingers. For 5 they put their hand like this  (similar to a V). What do you think they did for 4?" (4 fingers) "The Romans thought it was too hard to hold up 4 fingers for 4 so they decided to use IV to stand for 4. What does the sign IV mean?" Elicit 5 - 1 = 4. Write this on the chalkboard. "It is very hard to count using the Roman system. What symbol do you think stands for 6, 7, 8? For ten they used both hands () and the symbol X was written. How do you think they wrote 9? Remember, the Romans found it too hard to use 4 fingers." Elicit IX = 10 - 1 = 9. Continue through 12.

Prepare 2 sets of cards; one set with Arabic numerals 1 through 12, the second set with Roman numerals I through XII. Distribute one card to each student. Explain to the students that they are going to play a game called "Roman Match". Call a number. The students holding those cards will come to the front of the room and match their cards, e.g., 7 - VII. Continue this procedure using all the cards. Shuffle the cards and repeat.

3.01.07

3.01.07.01 **identify and write Roman numerals from XIII through XXXIX (13 through 39)**

STRATEGY 1: Prepare a set of flash cards having the numerals I, V, X, XX, and XXX printed on them. Prepare another set with the Arabic equivalents. Place the cards in a pocket chart. Divide the class into two (2) teams. Play a game of "Concentration" with them. Turn all of the cards face down in the pocket chart. Call upon a member of one team to turn over two (2) cards to determine if they have the same value. If the numerals have the same value, the team gets one (1) point and gets another turn. If the numerals do not have the same value, both cards are turned face down again and the other team gets a turn. The team having the most points wins the game.

STRATEGY 2: Prepare several cards of each of these Roman numerals: I, V, X, IV, IX. Place the cards on the chalkboard ledge. Say, "What is the Roman numeral for the the number 26?" Ask a student to arrange the cards in the correct order to form the roman numeral. (XXVI) Elicit from the class if the student is correct.

Repeat this procedure using other Arabic numbers through 39, e.g., 32, 18, 37.

3.01.07

3.01.07.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Prepare calendar sheets with Roman numerals to indicate the dates and distribute one to each student. Elicit from the students the answers to these questions based upon the calendar.

(1) What is the date of the first Tuesday?
(2) What will the date be 10 days from that Tuesday?
(3) What is the date of the last Sunday in the month?
(4) If John has to pay a bill on the XIV and it is now the VII, how many days does he have until the bill is due?

STRATEGY 2: Play "Roman Store." Prepare 30 sales slips and items such as a toga, wreath, hemlock, fiddle, etc., and mark each with a Roman numeral price tag. Each item must be less than 15¢. Distribute play money with Roman numerals on them up to 39¢. Ask the students to decide which items they want and to determine if they will have enough money to purchase these items. Ask the students to write the items and total cost on a sales slip.

P.O. 3.01.07.01

NAME: ______________________________ CLASS: __________ DATE: ________

Write the Roman or Arabic numeral that has the same value as the number shown.

13 XIII

19 ____

24 ____

33 ____

32 ____

26 ____

15 ____

17 ____

21 ____

39 ____

27 ____

23 ____

20 ____

37 ____

28 ____

15 ____

34 ____

XXIV 24

XXXI ____

XIX ____

XXVII ____

XXX ____

XIV ____

XVIII ____

XXVI ____

XXXIX ____

XXXIV ____

XXI ____

XXII ____

XX ____

XIII ____

XXV ____

XXIV ____

XXXIX ____

18 ____

XXVIII ____

XVII ____

14 ____

38 ____

16 ____

XVI ____

XXXV ____

XXIII ____

22 ____

31 ____

39 ____

35 ____

18 ____

29 ____

P.O. 3.01.07.02

NAME:________________________________ CLASS:__________ DATE:________

Solve each problem. Write your answer in Roman numerals.
Show all work.

1. Frank had XXVIII marbles. He gave his sister VII marbles. How many marbles does he have left?	Work Space
2. Cheryl had XXXIX picture cards. XXI were left outside in the rain and they tore. How many good cards does Cheryl have left?	
3. Mike has XVI fish in this tank. His dad is going to buy him V new fish. How many fish will Mike have in his tank with the new fish?	
4. Sue has XV pencils in her desk and XVI pencils in her pencil case. How many pencils does Sue have in all?	

3.06.04 RATIO

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.06.04.01A write a ratio to represent a relationship between two quantities;

e.g.,

2 ears to 1 bunny is read "2 to 1" and may be written $\frac{2}{1}$

The number of ears to the number of bunnies is 2 to 1.

3.06.04.02B solve word problems related to skills learned in this module.

e.g.,

Three apples cost 30¢. How much does one apple cost?

$\frac{30}{3}$ = 10¢ per apple

3.06.04

VOCABULARY

TERMS

ratio
fraction

GETTING STARTED

Write the following problems on the chalkboard.

e.g.,

1. If 6 tickets cost 50¢, how much do 3 tickets cost?
2. You can run 3 miles in 12 minutes, how many miles can you run in 1 minute?

Say, "Relationships exist between the numbers. What is the relationship in the first problem? The second problem?" Continue this activity until students can verbalize the relationships between numbers in a given problem.

Prepare and distribute two groups of chips to each student. Each group should be in a different color, e.g., red and blue.

Say, "I am going to say a math example for each group of chips. By finding the answer to the example, you will be finding the number of chips to be used from each group."

e.g.,

Blue group 2 x 3 =
Red group 12 - 9 =

Instruct students to compute the examples using the chips. Say, "How many chips does the red group have in this example? (6) How many chips does the blue group have in this example? (3) Various relationships exist between the two answers, e.g., the blue group has more chips than the red group; the blue group has twice as many chips as the red group." Continue this activity using other examples for each group of chips.

3.06.04

3.06.04.01 **write a ratio to represent a relationship between two quantities**

STRATEGY 1: Ask a group of students to come to the front of the room. Divide the students into two groups, boys and girls. Ask a student to count the number of individuals in each group. Write the numbers on the chalkboard, e.g., 9 boys, 5 girls. Ask the students how the groups compare to each other, e.g., there are more boys than girls. Say, "When we compare numbers or objects, we are finding relationships between the groups. This relationship is called a ratio." Write 9 to 5 on the chalkboard. Say, "When writing a ratio, the number representing the quantity of the first group is always written first. A ratio may be written in another form." Write $\frac{9}{5}$ on the chalkboard. Repeat this procedure using other representations of quantities.

STRATEGY 2: Prepare a flannel board and red and blue sandpaper backed shapes. Place three red shapes and five blue shapes on the flannel board. Say, "There are 3 red shapes as compared to 5 blue shapes." Write on the chalkboard, 3 red to 5 blue. Say, "This comparison of quantities is called a ratio. We can write this ratio comparing red chips to blue as 3 to 5." The number representing the first group is always written first. A ratio can be written in another form." Write $\frac{3}{5}$ next to 3 to 5 on the chalkboard. Repeat this procedure varying the numbers of chips in each group.

3.06.04

3.06.04.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following on the chalkboard.

Jason rode 3 miles on his bike in 10 minutes.

Ask a student to circle the numbers which represent a relationship between two quantities. Ask another student to come to the chalkboard and write the representation in ratio form, e.g., 3 to 10 or $\frac{3}{10}$.

Repeat this procedure using various examples. e.g.,

7 days to 1 week
3 tickets cost 4 dollars
24 cookies cost 75 cents

STRATEGY 2: Write the following problem on the chalkboard. e.g.,

John ran 4 miles in 2 minutes. What is the ratio of miles to minutes?

Ask a student to read the problem aloud and circle the parts of the problem that compare quantities.

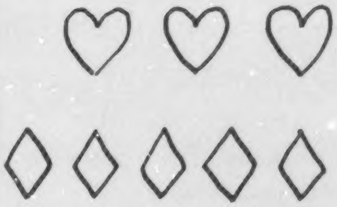
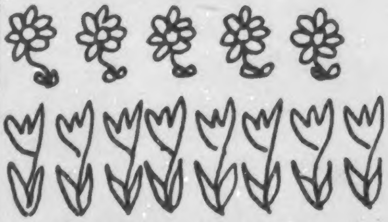
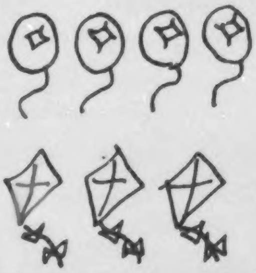
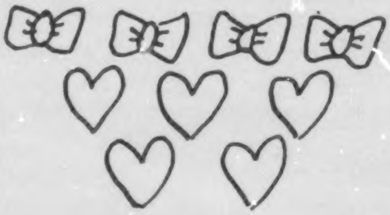
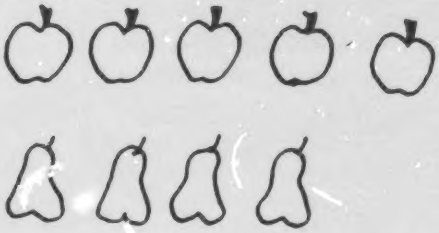
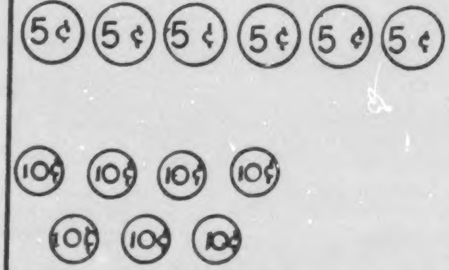
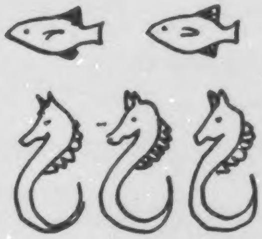
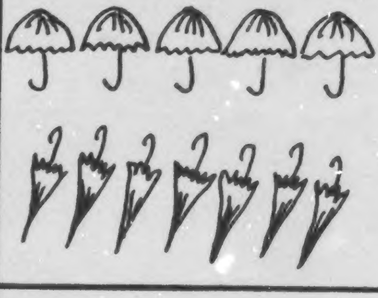
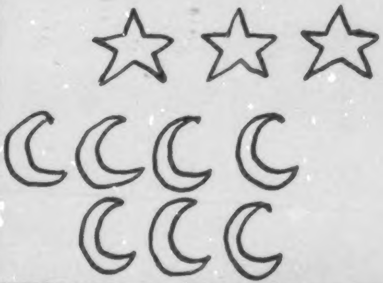
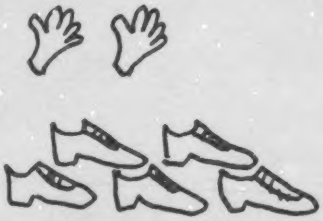
Say, "What are we asked to find?" Ask a student to formulate a ratio that corresponds to the problem. Write the ratio on the chalkboard, e.g., $\frac{4}{2}$ or 4 to 2.

Repeat this procedure using other word problems.

P.O. 3.06.04.01

NAME: ______________________ CLASS: __________ DATE: __________

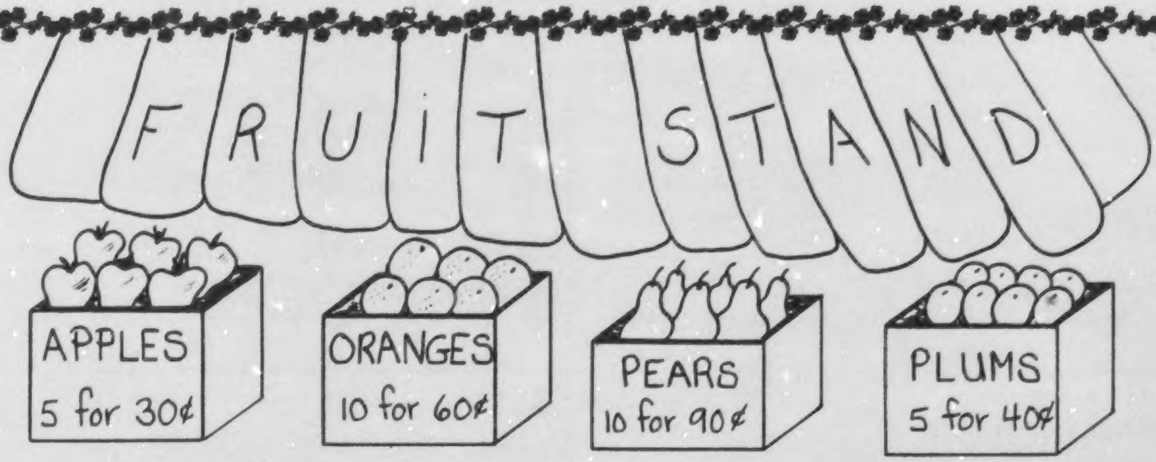
Write each example as a ratio.

SAMPLE  3 to 5 $\frac{3}{5}$	
	
	 5¢ 5¢ 5¢ 5¢ 5¢ 5¢ 10¢ 10¢ 10¢ 10¢ 10¢ 10¢ 10¢
	
	

P.O. 3.06.04.02

NAME: ______________________ CLASS: __________ DATE: ________

Write a ratio for each problem and solve.


FRUIT STAND
APPLES
5 for 30¢
ORANGES
10 for 60¢
PEARS
10 for 90¢
PLUMS
5 for 40¢

	Work Here
10 oranges cost 60¢. How much will 5 oranges cost?	
5 apples cost 30¢. How much does 1 apple cost?	
5 plums cost 40¢. How much will 10 plums cost?	
10 pears cost 90¢. How much will 1 pear cost?	
5 plums cost 40¢. How much does 1 plum cost?	

3.10.09 MEASUREMENT-SPEED

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.10.09.01C	identify uniform speed as rate; e.g., A car travels 40 miles per hour. Rate = 40 miles per hour.
3.10.09.02C	identify time as the number of hours traveled; e.g., time = 8 hours traveled
3.10.09.03C	solve word problems related to skills learned in this module. e.g., Bill traveled 50 miles per hour for 3 hours. How far did Bill travel? 50 x 3 = 150 miles

3.10.09

VOCABULARY

TERMS

rate
time

GETTING STARTED

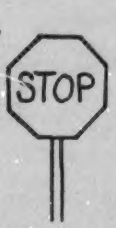
Ask two students to stand at opposite ends of the front of the room. Hand one student a small rubber ball. Ask the students to demonstrate rolling the ball back and forth to each other. Say, "Roll the ball to each other for one minute." Ask the remaining students to count the number of rolls that will be made. Signal to the students when to begin rolling the ball. Stop the students after one minute. Ask the students the number of rolls made in the specified time. Record the response on the chalkboard. Repeat this procedure with the students now tossing the ball to each other for one minute. Ask the students for the number of tosses made in the one minute. Record the findings on the chalkboard. Say, "Compare the two numbers. Did the students roll or toss the ball more times? Why do you think tossing the ball produced a greater number than rolling the ball?" (speed was greater) Repeat this activity using other examples of differences in speed.

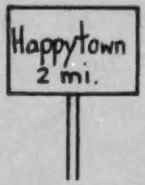
Say, "How many students walk to school? How many students that walk to school were ever driven to school? What was the difference between walking and riding to school?" Display a large map of the United States at the chalkboard. Say, "A train and a plane are both leaving New York for California at the same time." Use two different colors of chalk to designate the plane from the train. Say, "Both the train and the plane have been traveling for three hours. The plane is ahead of the train. The plane has greater speed than the train. This enables the plane to cover a greater distance within a certain amount of time." Repeat this procedure using other examples of the effect of differences in speed.

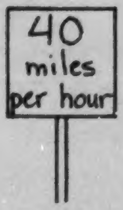
3.10.09

3.10.09.01 identify uniform speed as rate

STRATEGY 1: Draw traffic signs on the chalkboard.
e.g.,







Say, "Have you ever seen signs like these before?" Ask a student to point to the signs that mean do not go ahead, and the distance to a place. Say, "This last sign represents the speed limit for a certain area. The speed represents how fast an object is moving or how fast it can move. The speed of an object is called the rate. Rate is measured in miles or kilometers per hour." Write the following statement on the chalkboard, "A car travels at 50 miles per hour." Ask a student to underline the part of the sentence that tells how fast the car travels. Under the statement write Rate = 50 miles per hour. Repeat this procedure.

STRATEGY 2: Draw a representation of a speedometer on the chalkboard. Say, "A speedometer measures the speed of a moving object. The speed of a moving object is called the rate. The rate is measured by miles or kilometers per hour." Write on the chalkboard Rate = __ miles per hour. Point to a number on the speedometer. Say, "This car is traveling at 50 miles per hour. What is the rate at which the car is traveling?" Write Rate = 50 miles per hour.

Repeat this procedure.

3.10.09

3.10.09.02 **identify time as the number of hours traveled**

STRATEGY 1: Prepare and distribute two cardboard clocks with moveable hands to each student. Say, "Mr. Jones left for work at 7:00 in the morning. He arrived at his job at 9:00 AM. How long was Mr. Jones traveling?" Ask the students to show 7:00 on the first clock and 9:00 on the second clock. Say, "Count to find the total number of hours that Mr. Jones traveled that morning."

Repeat this procedure.

STRATEGY 2: Draw this chart on the chalkboard.

e.g.,

	Bus Leaves	Bus Arrives	Total Time Traveling
Bus #1	4:00 PM	7:00 PM	
Bus #2	5:00 PM	9:00 PM	
Bus #3	9:00 AM	11:00 AM	
Bus #4	10:00 AM	2:00 PM	

Say, "The chart represents certain buses at a bus depot." Ask the students to state the meaning of AM and PM. Point to Bus #1 on the chart. Say, "What time did Bus #1 leave the station? (4:00 PM) What time did the bus arrive at its destination? (7:00 PM) Find the total number of hours that the bus spent traveling." (3) Place the answer under the heading of "Total Time Traveling". Say, "The three hours represents the number of hours that the bus traveled. Repeat this procedure using the other examples on the chart.

3.10.09

3.10.09.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following word problem on the chalkboard.

> John's father drove 40 miles per hour for four hours. How far did John's father travel?

Ask a student to read the problem. Say, "What does the problem want us to find? (number of miles John's father traveled) How many miles did John's father drive in one hour? (40 miles) If John's father drove 40 miles in one hour, how many miles did he drive in 4 hours?" Write the following on the chalkboard.

e.g.,

40 + 40 + 40 + 40 = 160 miles

Say, "A shorter way to find the answer is to multiply the miles per hour by the number of hours traveled."

e.g.,

$$\begin{array}{r} 40 \\ \underline{\times 4} \\ 160 \text{ miles} \end{array}$$

Repeat this procedure using other problems.

STRATEGY 2: Display pictures of different brands of sneakers mounted on individual cards. Show the card to the students and say, "Bill ran 5 miles per hour for 4 hours wearing this brand of sneakers. How far did Bill run? In order to find the distance Bill ran, you must multiply the number of miles Bill ran per hour by the number of hours Bill actually ran. Write a multiplication number sentence for this problem, e.g., 5 x 4 = ☐ ."

Ask a student to solve the equation and label the answer. Repeat this procedure.

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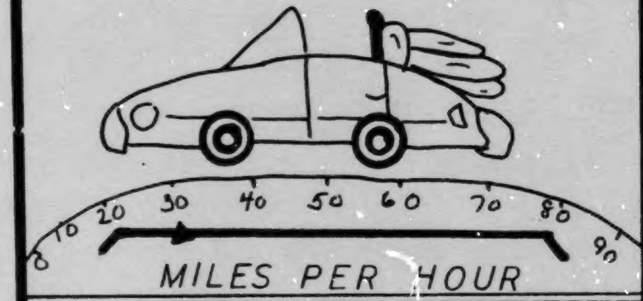
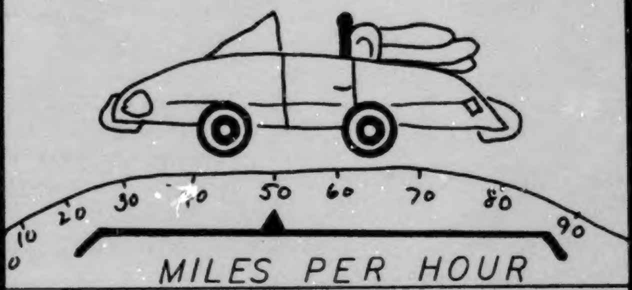
P.O. 3.10.09.01

NAME: ______________________________ CLASS: __________ DATE: ________

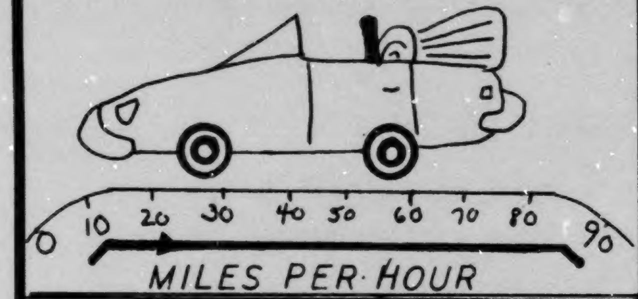
How fast is each car traveling?
Write the rate of each car.


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

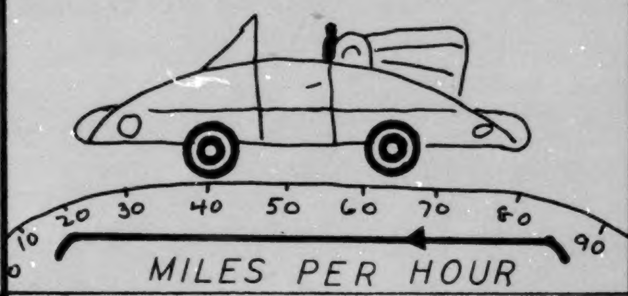
RATE = 30 miles per hour


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

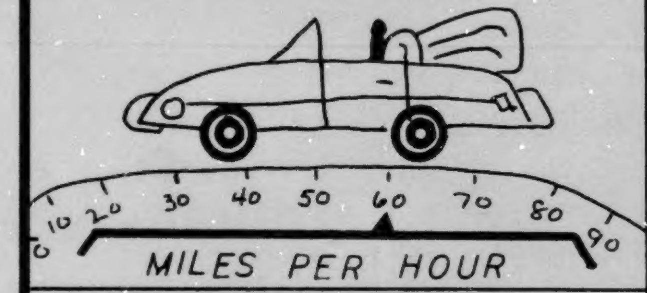
RATE =


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

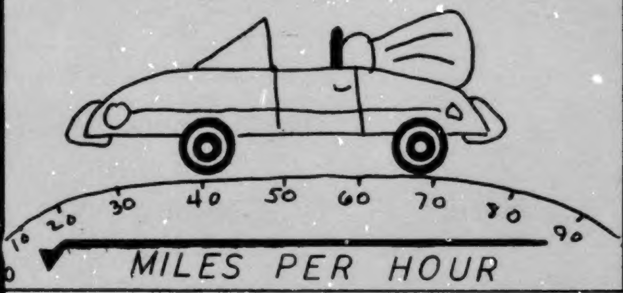
RATE =


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

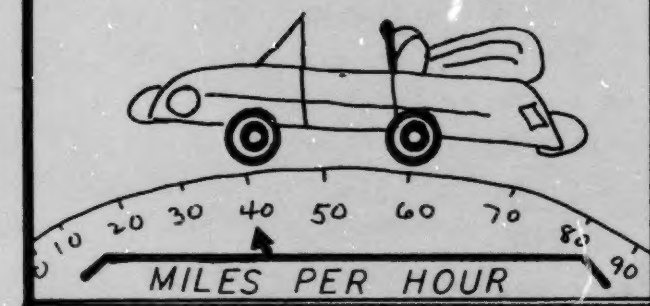
RATE =


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

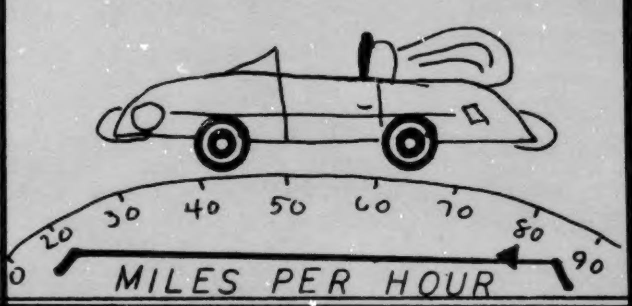
RATE =


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

RATE =


0 10 20 30 40 50 60 70 80 90
MILES PER HOUR

RATE =


0 20 30 40 50 60 70 80 90
MILES PER HOUR

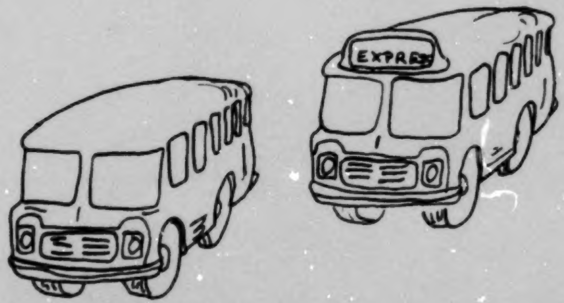
RATE =

P.C. 3.10.09.02

NAME:________________________ CLASS:________ DATE:_______

Complete the table from the "All-Around Bus Company".
Find the number of hours that each bus traveled.

Bus Number	City Bus Leaves From	Time Bus Leaves	City Bus Arrives At	Time Bus Arrives	Hours Spent Traveling
23	New York City	1:00 P.M.	Trenton, N.J.	4:00 P.M.	
144	Miami	10:00 A.M.	Fort Lauderdale	2:00 P.M.	
216	Los Angeles	11:00 P.M.	San Diego	1:00 A.M.	
9	Houston	7:00 A.M.	Dallas	12 noon	
65	Albany	9:00 P.M.	New York City	12 midnight	
82	Phoenix	3:00 P.M.	San Diego	11:00 P.M.	
127	Richmond	4:00 P.M.	Norfolk	5:00 P.M.	

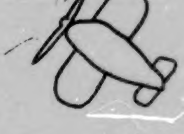


517

P.O. 3.10.09.03

NAME: ____________________ CLASS: __________ DATE: ________

Solve each problem.

	Work Here
Mary's mother drove 40 miles per hour for 3 hours. How far did Mary's mother drive?	
John rode his bicycle at 10 miles per hour for 2 hours. How far did John ride his bicycle?	
The plane traveled at 90 miles per hour for 6 hours. How far did the plane travel? 	
The train traveled at 60 miles per hour for 4 hours. How far did the train travel?	

518

3.01.08 ORDINAL NUMBERS THROUGH 500

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

3.01.08.01A use an ordinal number to name a position in a row up to 99;
e.g.,

○ ○ ○ ○ ○ ● ○ sixth from the left

3.01.08.02A identify the ordinal position of each object in a row or series up to 500 objects;
e.g.,

○○○○○○○○○○○○○○○○○○○●

twentieth from the left

3.01.08.03B write cardinal numbers with corresponding ordinal numbers.
e.g.,

17 ——> seventeenth (17th)

3.01.08

VOCABULARY

TERMS

cardinal
ordinal

GETTING STARTED

Ask ten students to line up in size order. Say, "Who is first on line? If we numbered the children one through ten, what would his/her position be?" Write "first" on the chalkboard. Say, "First corresponds to one." Continue the same questioning for second and third, writing the name on the chalkboard each time and eliciting that second corresponds to 2, and third corresponds to 3. Ask students to continue calling out the places on line and writing the ordinal number for each place.

Divide the class into two (2) teams. One team has flash cards with cardinal numbers (1 through 20). The other team has flash cards with ordinal numbers (first to twentieth). Say a number, e.g. 6. The student with the cardinal number card and the student with the ordinal number card will stand. The student who stands first will win a point for his/her team. When one team accumulates ten points, the teams switch cards giving each student on each team the opportunity to work with both cardinal and ordinal numbers.

3.01.08

3.01.08.01 **use an ordinal number to name a position in a row up to 99**

STRATEGY 1: Ask students to take out their basal reader. Say, "Turn to the forty-fifth page." Call upon one student to tell the class the name of the story on that page. Say, "Turn to the eighty-first page." Call on another student to tell the name of the story on that page. Repeat the procedure using fifty-seventh, twenty-third and forty-ninth.

STRATEGY 2: Ask a student to stand. Say, "Go to the bookcase and take out the thirty-seventh book from the left on the middle shelf. What is the title?" After answering correctly, the student will place the book back in position. Repeat the procedure using other ordinal numbers to 99.

3.01.08.02 **identify the ordinal position of each object in a row or series up to 500 objects**

STRATEGY 1: Ask students to take out their dictionaries (or any other thick book). Say, "Turn to the one hundred twenty-second page. Find a word on the page that shows a picture." Elicit from the students the words they found as a check that the students turned to the correct page.

Repeat this procedure for other ordinal numbers to 500.

STRATEGY 2: Prepare and distribute calendars which show the 12 months of a year appearing on one page. (Banks give out calendars that are made to fit into a wallet.) Say, "What is the twenty-third day of the year?" Call upon one student to give the month and the date. Say, "What is the fiftieth day of the year?" Call upon one student to give the month and the date. Repeat this procedure through the three hundred sixty-fifth day.

3.01.08.03 write cardinal numbers with corresponding ordinal numbers

STRATEGY 1: Prepare two sets of cards: one set containing cardinal numbers 1 through 20, the second set containing ordinal numbers in the written and symbolic form, e.g., first-1st, second-2nd ...twentieth-20th. Distribute the cards to the students. Call a number, e.g., 2. The student holding the card numbered "2" will come up to the front of the room with his/her card. Say, "Who has the ordinal card to match this number?" The student holding the "second" card will come to the front of the room and show his/her card. On the chalkboard, write the numeral 2 and the word "second" followed by its symbolic representation, 2nd.

Repeat this procedure using the remainder of the cards.

STRATEGY 2: Write the ordinal numbers first through twentieth on the chalkboard. Ask a student come to the chalkboard and write the cardinal number next to

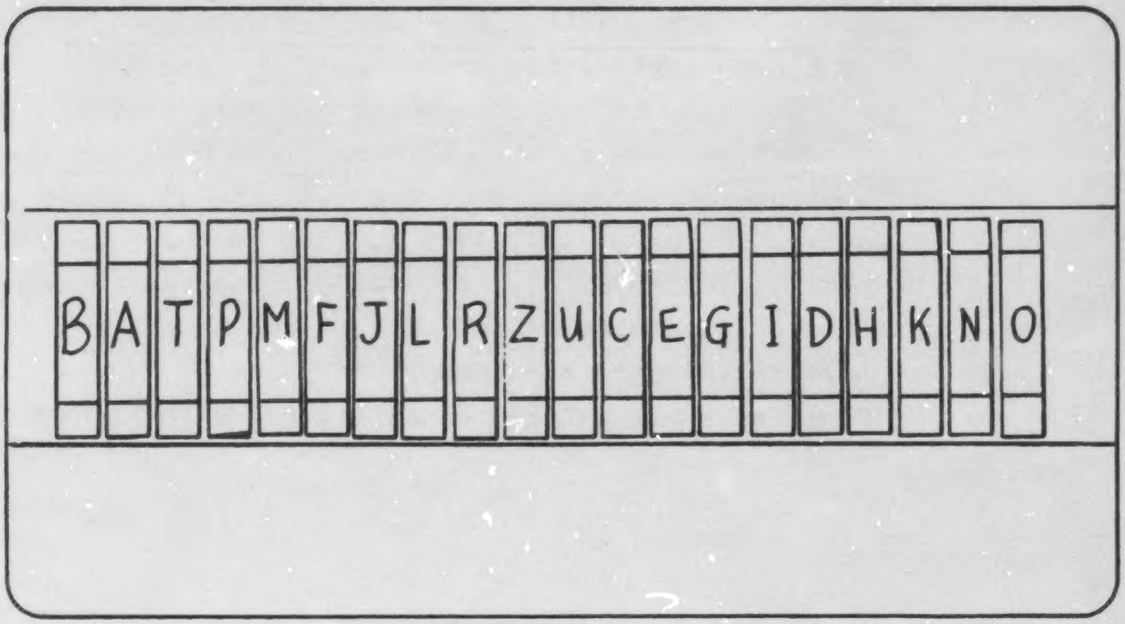
STRATEGY 2: cont'd

the ordinal number. Distribute flash cards numbered 1 through 20 and ordinal numbered flash cards in words (fourth, twelfth) with the numeric ordinal symbol (4th, 12th) next to each word. Label one part of the chalkboard Cardinal and another part of the chalkboard Ordinal. Ask a student to come to the chalkboard and have him/her tape his/her flashcard to the chalkboard in the correct column. Say, "Who has the corresponding ordinal (or cardinal) number? Come to the chalkboard and tape your card in the proper column next to the card to which it corresponds." Continue until all the cards are taped to the chalkboard.

P.O. 3.01.08.01

NAME: ______________________ CLASS: ________ DATE: ________

Use the picture to answer the question.



1. What letter is on the fourteenth volume from the left? ________.
2. The letters on the fifteenth, twelfth, and thirteenth volume spell ________.
3. The letter K is on the ________ volume.
4. Place a blue "J" on the eighth volume.
5. Place a red "X" on the second volume.
6. The letter J is on the ____________ volume.
7. The letter Z is on the ____________ volume.
8. The letters on the seventeenth, twentieth, and third volume spell ____________.
9. Place a red "J" on the ninth volume.
10. Place a blue "X" on the sixth volume.

P.O. 3.01.08.02

NAME: ______________________ CLASS: __________ DATE: ________

Mark the calendar according to the directions on page 72c.

1983

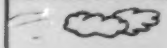
January

						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

February

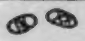
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

March



		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

April



					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

May

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

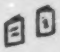
July

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

August

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September



				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

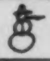
October

						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

November

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

December



				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

P.O. 3.01.08.02

NAME:________________ CLASS:________ DATE:_______

1. Put an X on the one hundred twenty-third day.

2. What is the date of the two hundred forty-first day?

3. Color the 24th blue.

4. Draw a box around the three hundred twenty-first, three hundred twenty-second and three hundred twenty-third days.

5. Draw a circle around the thirty-fourth, thirty-fifth and thirty-sixth days.

6. Color the one hundred ninety-ninth day red.

7. In the month of April color the twenty-ninth day green.

8. In the month of January color the twelvth day yellow.

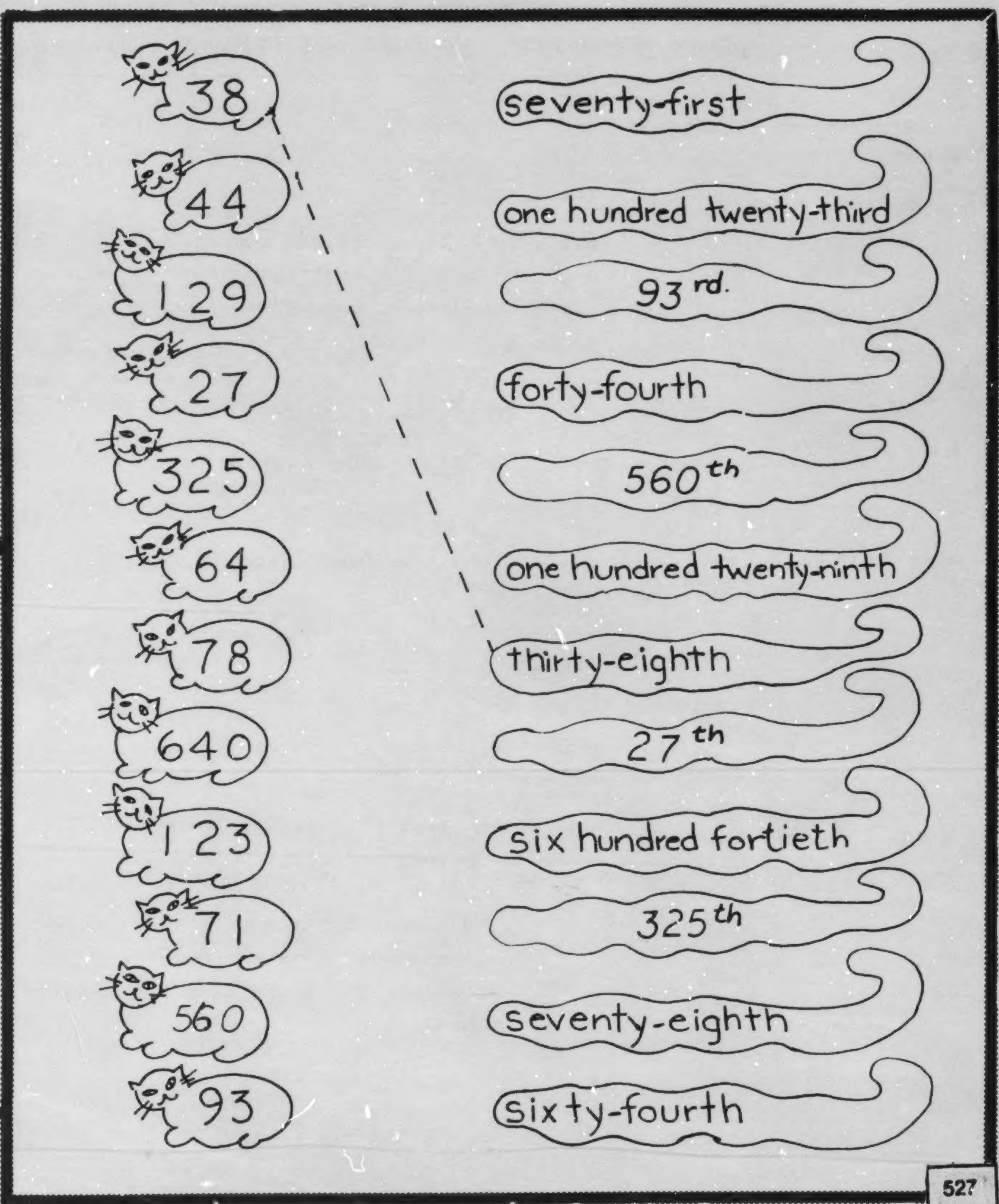
* Did you find an easy way to count the days on the calendar? Tell us what you did.

526

P.O. 3.01.08.03

NAME: ______________________ **CLASS:** __________ **DATE:** ________

Connect the cat to its tail.
Draw a line from the cardinal number to the ordinal number.


38
44
129
27
325
64
78
640
123
71
560
93
seventy-first
one hundred twenty-third
93rd.
forty-fourth
560th
one hundred twenty-ninth
thirty-eighth
27th
six hundred fortieth
325th
seventy-eighth
sixty-fourth

Unit 64

3.04.11 MULTIPLICATION THROUGH 3-DIGIT NUMBERS BY A 1-DIGIT NUMBER WITH REGROUPING (EXCHANGE)

(3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.04.11.01B multiply a 2- or 3-digit number by a 1-digit number with regrouping (exchange), using the partial product method;

e.g.,

$$\begin{array}{rl} 243 & \\ \times\ \ 8 & \\ \hline 24 & (8\times3) \\ +\ 320 & (8\times40) \\ 1600 & (8\times200) \\ \hline 1944 & \end{array}$$

3.04.11.02B use the short multiplication algorithm to multiply a 2- or 3-digit number by a 1-digit number;

e.g.,

$$\begin{array}{r} 25\ \\ 627 \\ \times\ \ 8 \\ \hline 5016 \end{array}$$

3.04.11.03B solve word problems related to skills learned in this module.

e.g.,

Two hundred sixteen pencils fit in one box. There are 8 boxes. How many pencils will be put in boxes?

$$\begin{array}{rl} 14\ & \\ 216 & \\ \times\ \ 8 & \\ \hline 1{,}728 & \text{pencils} \end{array}$$

3.04.11

VOCABULARY

TERMS

expanded notation

GETTING STARTED

Write the chart and examples on the chalkboard.

63	24	842	66	30	363	36	64	84	28	70
Y	U	H	N	M	A	K	W	T	O	R

$\begin{array}{r} 21 \\ \times\ 3 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 14 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 12 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$		$\begin{array}{r} 12 \\ \times\ 3 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 33 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 28 \\ \times\ 1 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 32 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$	
$\begin{array}{r} 63 \\ \times\ 1 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 7 \\ \times\ 4 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 6 \\ \times\ 4 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 70 \\ \times\ 1 \\ \hline \\ \underline{\quad} \end{array}$		$\begin{array}{r} 10 \\ \times\ 3 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 121 \\ \times\ 3 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 42 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$	$\begin{array}{r} 421 \\ \times\ 2 \\ \hline \\ \underline{\quad} \end{array}$

Ask the students to solve the examples and use the key to find the secret message. Write the corresponding letter under the example. e.g.,

$$\begin{array}{r} 21 \\ \times\ 3 \\ \hline 63 \\ \\ \underline{\ Y\ } \end{array}$$

Write 326 on the chalkboard. Ask a student to write the number in expanded notation, e.g., 300 + 20 + 6. Repeat this procedure using other numbers.

3.04.11

3.04.11.01 **multiply a 2- or 3-digit number by a 1-digit number with regrouping (exchange), using the partial product method**

STRATEGY 1: Distribute squared material to each student. Write the following example on the chalkboard.

e.g.,

$$\begin{array}{r} 367 \\ \underline{\times\ 3} \end{array}$$

Say, "We can solve this problem by using expanded notation." Ask a student to come to the chalkboard and write 367 in its expanded form, e.g., 300+60+7. Say, "Using your squared material show 3 groups of seven." Write the following on the chalkboard.

e.g.,

$$\text{A)}\ \begin{array}{rl} 367 & \\ \underline{\times\ 3} & \\ 21 & (3 \times 7) \end{array} \qquad \text{B)}\ \begin{array}{rl} 367 & \\ \underline{\times\ 3} & \\ 21 & (3 \times 7) \\ 180 & (3 \times 60) \end{array} \qquad \text{C)}\ \begin{array}{rl} 367 & \\ \underline{\times\ 3} & \\ 21 & (3 \times 7) \\ 180 & (3 \times 60) \\ \underline{900} & (3\times 300) \end{array}$$

Say, "Show 3 groups of sixty." Write B on the chalkboard. Say, "Show 3 groups of three hundred." Write C on the chalkboard. Say, "When we add the three partial products, we will have the product of 3 x 367."

e.g.,

$$21 + 180 + 900 = 1102$$

Repeat this procedure using other examples.

STRATEGY 2: Write $\begin{array}{r} 453 \\ \underline{\times\ 6} \end{array}$ on the chalkboard. Say, "In order to make this example easier, we can expand and multiply to find the product." Ask several students to come to the chalkboard to solve the following.

e.g.,

$$\begin{array}{rcrcrcl} 400 & + & 50 & + & 3 & & \\ \underline{\times\ 6} & & \underline{\times 6} & & \underline{\times 6} & & \\ 2400 & + & 300 & + & 18 & = & 2718 \end{array}$$

530

Repeat this procedure using other examples.

3.04.11

3.04.11.02 **use the short multiplication algorithm to multiply a 2- or 3-digit number by a 1-digit number**

STRATEGY 1: Write $\begin{array}{r}56\\ \underline{x4}\end{array}$ on the chalkboard. Say, "We are going to learn a short way to multiply. How much is four times six? (24) Write the 4 ones in the ones column of the product and regroup 20 ones as 2 tens. Place the 2 tens in the tens column. How much is 4 times 5 tens? (20 tens) We add the 2 tens to the twenty tens giving us twenty-two tens." Ask a student to come to the chalkboard to write the product.

e.g.,

$$\begin{array}{r}2\\ 56\\ \underline{x4}\\ 224\end{array}$$

Say, "We must multiply before we add whenever there is regrouping." Repeat this procedure using other examples.

STRATEGY 2: Write $\begin{array}{r}627\\ \underline{x\ 8}\end{array}$ on the chalkboard. Say, "There is a short way to multiply. We use the same method of regrouping used in addition and multiplication. Remember, in multiplication we multiply before we add the regrouped number." Ask a student to complete the example on the chalkboard.

e.g.,

$$\begin{array}{r}627\\ \underline{x\quad 8}\\ 5{,}016\end{array}$$

3.04.11

3.04.11.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

> There are 144 apples in a crate. There are 8 crates. How many apples are there in all?

Ask one student to solve the problem using expanded notation, and another student to solve it using the short method.

e.g.,

$$\begin{array}{rl} 144 & \\ \times\ 8 & \\ \hline 32 & (8\times4) \\ 320 & (8\times40) \\ 800 & (8\times100) \\ \hline 1152 & \end{array} \qquad\qquad \begin{array}{r} 33 \\ 144 \\ \times\ \ 8 \\ \hline 1152 \end{array}$$

Say, "The answers will be the same for both the expanded form and the short form." Repeat this procedure.

STRATEGY 2: Prepare a set of index cards with a word problem written on each.

e.g.,

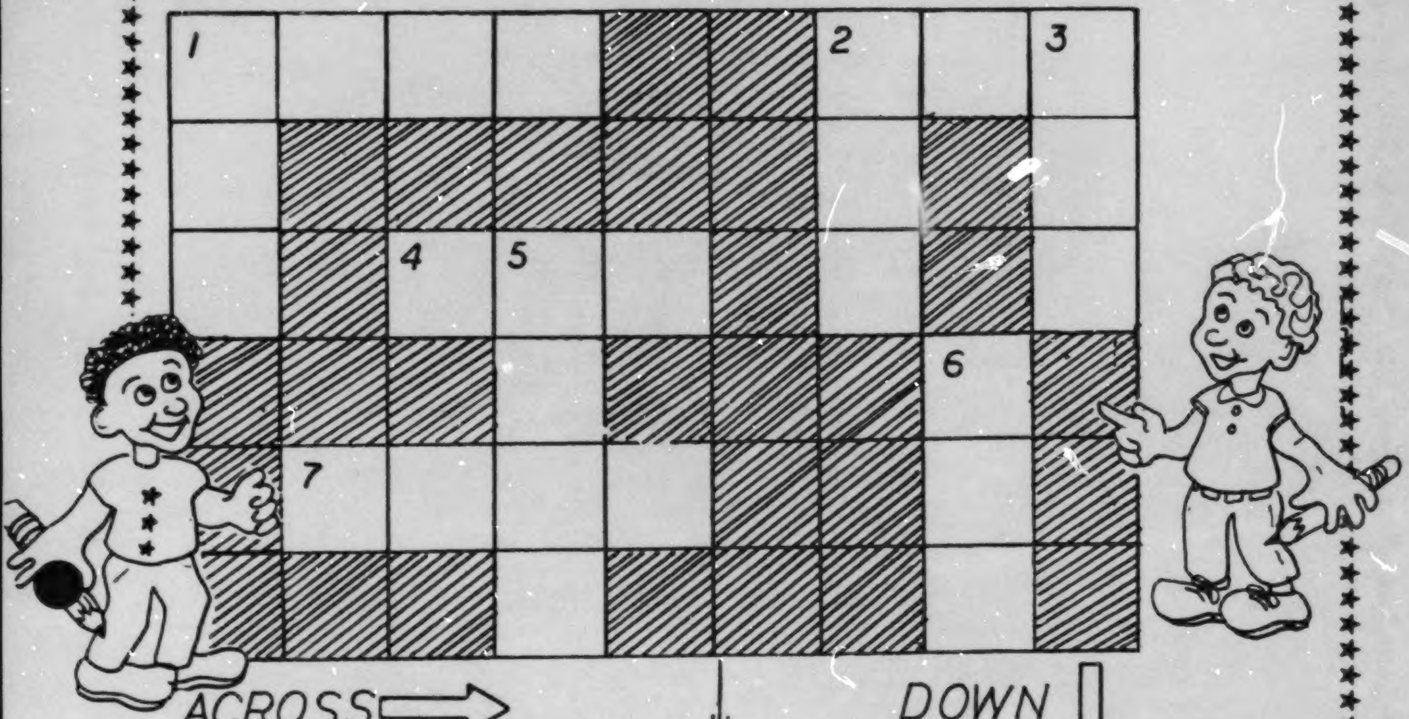
> There are 365 days in a year. How many days are there in 7 years?

Distribute one card to each student and ask each student to solve the problem in two ways, first using expanded notation and then using the short method. Ask students to switch cards, and repeat the procedure.

P.O. 3.04.11.01

NAME: ______________________________ CLASS: __________ DATE: __________

Solve each problem using the partial product method, then complete the puzzle.



ACROSS →

1 596 X 8

2 108 X 7

4 379 X 2

7 432 X 4

DOWN ↓

1 52 X 9

2 247 X 3

3 113 X 7

5 732 X 7

6 79 X 7

P.O. 3.04.11.02

NAME:______________________________ CLASS:__________ DATE:________

Complete the puzzle by using the multiplication examples as clues.

A		B	▨	C	
	▨	D			▨
	▨		▨	▨	E
▨	F	▨	G		
H		▨		▨	
▨		▨		▨	▨
I	▨	▨	▨	▨	▨
J				▨	▨

147
× 5

27
× 3

251
× 3

264
× 2

43
× 6

41
× 7

44
× 2

47
× 8

12
× 2

523
× 4

314
× 3

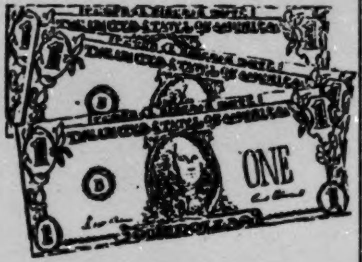
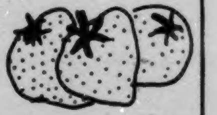
53
× 4

36
× 2

P.O. 3.04.11.03

NAME:________________________________ CLASS:________ DATE:________

Solve the problems using both expanded and short methods.

You drink 8 ounces of milk each day, and there are 365 days in a year. How many ounces of milk do you drink in a year?	
If you earn $215 a week how much do you earn in 8 weeks? 	
There are 119 pencils in each box. How many pencils are there in 5 boxes?	
There are 375 books on each shelf in the library. How many books are on the shelves?	
There are 63 strawberries in a quart. How many strawberries are in 3 quarts? 	

3.05.08 DIVISION WITH REMAINDERS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.05.08.01B recognize a remainder as that which is "left over" in division;
e.g.,

$$\begin{array}{r} 3 \\ 6\overline{)19} \\ -18 \\ \hline 1 \end{array} \text{ remainder}$$

3.05.08.02B solve word problems related to skills learned in this module.
e.g.,

Mary had 12 cookies to share equally among 5 friends. How many cookies will each friend receive? How many cookies will be left over?

$$\begin{array}{r} 2 \\ 5\overline{)12} \\ -10 \\ \hline 2 \end{array}$$

Each friend got 2 cookies. Two cookies are left over.

3.05.08

VOCABULARY

TERMS

remainder

GETTING STARTED

Ask six students to come to the front of the room. Say, "Take a partner. How many groups of two students do we have?" (3) Show the division algorithm on the chalkboard, e.g., $2\overset{3}{\overline{)6}}$. Repeat this procedure increasing the number of students and changing the divisor.

Review the repeated subtraction definition of division without remainders.

e.g.,

$$\begin{array}{rrl}
 & 3 & \\
2) & \overline{\;6} & \\
 & \underline{-2} & 1\text{ two} \\
 & 4 & \\
 & \underline{-2} & 1\text{ two} \\
 & 2 & \\
 & \underline{-2} & \underline{1\text{ two}} \\
 & 0 & 3\text{ twos}
\end{array}$$

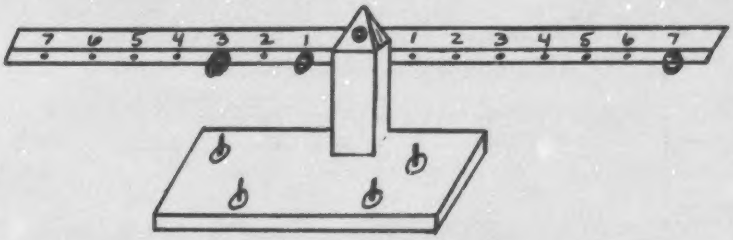
Say, "Three groups of 2 were subtracted." Continue this procedure using other division facts with no remainders.

3.05.08

3.05.08.01 **recognize a remainder as that which is "left over" in division**

STRATEGY 1: Place 13 counters or discs on a display board. Ask a student to make as many groups of three counters as possible. Write the example $3\overline{)13}$ on the chalkboard. Say, "How many groups of three are in thirteen? (four groups of three and one left over) We call the one that is left over the remainder." Repeat this procedure using other division examples with remainders.

STRATEGY 2: Display a number balance.
e.g.,



Write $3\overline{)7}$ on the chalkboard. Say, "We want to know how many groups of three are in seven." Put a weight on the 7 on one side of the balance. Say, "How many sets of 3 will make the balance even?" Keep experimenting with different amounts until the students see that 2 threes are too light and 3 threes are too heavy. Say, "What should we do now?" (add one more weight to the 2 groups of three) Write 2 threes + 1 more = 7. Say, "The 1 more is called the remainder." Continue this procedure using other division examples with remainders.

3.05.08

3.05.08.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following word problem on the chalkboard.

> There are 20 carrots to be shared equally among 6 children. How many carrots will each child receive? How many will be left?

Elicit the steps to follow in solving problems.

Ask a student to come to the chalkboard and draw 20 carrots and circle groups of six. Ask another student to count the groups and the carrots left over. Ask a third student to come to the chalkboard to complete the division example, $6\overline{)20}$.

Say, "Twenty divided by six equals three with a remainder of two."

Repeat this procedure using other examples.

STRATEGY 2: Write the following word problem on the chalkboard.

> I have 30 tickets to the circus to be shared equally among 7 families. How many tickets will each family receive? How many tickets will be left over?

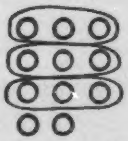
Say, "What information are we given? What are the key words? What must we do to solve this problem?" Ask several students to role play this word problem and distribute the tickets (slips of paper) to each child or family. Write the corresponding example on the chalkboard, $30 \div 7 = \quad$, $7\overline{)30}$. Say, "How many tickets does each family get? (4) How many are left over?" (2)

Repeat this procedure using other word problems.

P.O. 3.05.08.01

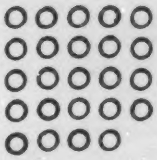
NAME: ________________________ CLASS: __________ DATE: ________

Circle the groups and complete each example using remainders.



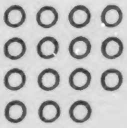
$$\begin{array}{r} 3\ \text{R.}2 \\ 3\overline{)11} \\ -\ 9 \\ \hline 2 \end{array}$$

$11 \div 3 = \boxed{}$



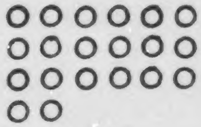
$24 \div 5 =$

$5\overline{)24}$



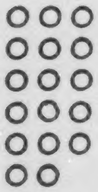
$15 \div 4 =$

$4\overline{)15}$



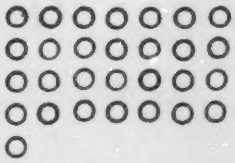
$20 \div 6 =$

$6\overline{)20}$



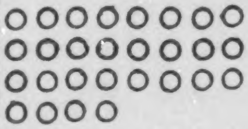
$17 \div 3 =$

$3\overline{)17}$



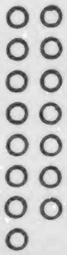
$29 \div 7 =$

$7\overline{)29}$



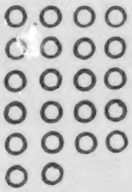
$28 \div 8 =$

$8\overline{)28}$



$15 \div 2 =$

$2\overline{)15}$



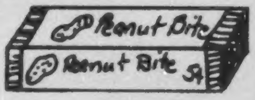
$22 \div 4 =$

$4\overline{)22}$

P.O. 3.05.08.02

NAME: ____________________ CLASS: ________ DATE: ______

Solve each problem.

There were 16 turtles in a pet store The man put 3 turtles in each tank. How many tanks did he use? How many turtles were left over?	WORK SPACE
Kevin had 27¢. He spent it for 5¢ candy bars. How many 5¢ candy bars did he buy? How much money did he have left over? 	
Mr. Jones had 15 dimes. He divided them among his 2 children. How many dimes did each child get? How much was left over?	
Maria bought 16 markers. She divided them among 3 friends. How many did she have left for herself?	

3.06.05 IMPROPER FRACTIONS AND MIXED NUMBERS

(2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.06.05.01B define and identify an improper fraction;
e.g.,

$\frac{5}{4}$ is an improper fraction

3.06.05.02B define and identify a mixed number;
e.g.,

$7\frac{1}{2}$ is a mixed number

3.06.05.03B change an improper fraction to a mixed number;
e.g.,

$\frac{5}{3} \longrightarrow 1\frac{2}{3}$

3.06.05.04B change a mixed number to an improper fraction.
e.g.,

$1\frac{2}{3} \longrightarrow \frac{5}{3}$

VOCABULARY

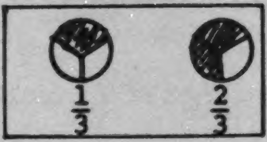
TERMS

whole number
numerator
denominator
mixed number
improper fraction

GETTING STARTED

Prepare a set of flashcards with two fractions drawn on each. Write the fraction name under each picture.

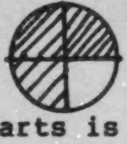
e.g.,



Say, "A fraction is part of a whole." Present the first card to the students and ask them to identify the number of parts in each whole. Say, "Identify the number of parts of each fraction which are shaded. Which of the two is the larger fraction?" ($\frac{2}{3}$) Repeat this procedure using the other cards.

Place the following fractional representation on a flannel board.

e.g.,



Say, "Into how many parts is the whole divided?" (4) Say, "How many of the parts are shaded?" (3) Ask a student to name the fraction that the drawing represents. Write the fraction $\frac{3}{4}$ on the chalkboard.

Repeat this procedure using other representations of different fractions.

3.06.05

3.06.05.01 define and identify an improper fraction

STRATEGY 1: Display two large sheets of red construction paper. Say, "Each sheet represents one whole." Cut each sheet into fourths. Ask a student to write the fraction that represents each whole red sheet ($\frac{4}{4}$). Ask a student to show four red pieces and then move two more pieces next to them. Write the fraction that now represents the six pieces, e.g., $\frac{6}{4}$. Say, "$\frac{6}{4}$ is called an improper fraction. An improper fraction is a fraction whose numerator is larger than its denominator."

Repeat this procedure using other examples of improper fractions.

STRATEGY 2: Write $\frac{5}{3}$ on the chalkboard. Say, "This is an improper fraction. The numerator is greater than the denominator."

Write the following fractions on the chalkboard. e.g.,

$\frac{2}{4}$ $\frac{5}{3}$ $\frac{5}{8}$ $\frac{9}{6}$

Ask a student to come to the chalkboard, circle the improper fractions in the group and state why each fraction he/she circled is an improper fraction. Repeat this procedure.

3.06.05.02 define and identify a mixed number

STRATEGY 1: Prepare and display a whole apple and $\frac{1}{2}$ of another apple. Say, "How many apples do we have in all?" Elicit 1 plus $\frac{1}{2}$. Write $1\frac{1}{2}$ on the chalkboard. Say, "We read this number as one and one-half. This is called a mixed number because there is a whole number and a fraction."

STRATEGY 1: cont'd Repeat this procedure using other examples of mixed numbers. Ask the students to identify and define the mixed numbers.

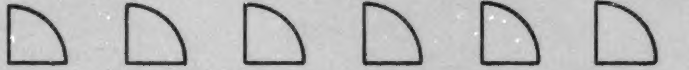
STRATEGY 2: Write $1\frac{2}{3}$ on the chalkboard. Say, "This is a mixed number. It is made up of a whole number and a fraction. Which number represents the whole number?" Circle the whole number. Say, "Which number represents the fraction?" Draw a box around the fraction.

Prepare a set of flashcards with a fraction, whole number or mixed number on each. Present each card to the students. Elicit which type of number is represented. Repeat this procedure until all of the cards have been presented and correctly identified.

3.06.05.03 **change an improper fraction to a mixed number**

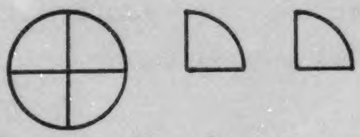
STRATEGY 1: Prepare a display of 6 fourths on a flannel board or draw them on the chalkboard.

e.g,



Ask a student to come to the flannel board and count the number of fourths. Write $\frac{6}{4}$ on the chalkboard. Say, "What kind of fraction is $\frac{6}{4}$? (improper fraction) We can change an improper fraction to a mixed number by determining how many wholes are in the fraction." Ask a student to construct the wholes.

e.g.,

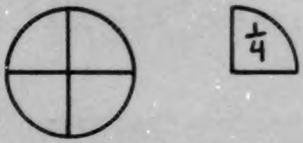


Say, "What mixed number is now represented?" ($1\frac{2}{4}$)

Repeat this procedure using various representations of improper fractions.

STRATEGY 2: Write $\frac{5}{4}$ on the chalkboard. Using concrete objects, e.g., construction paper, apples, grapefruit, demonstrate that $\frac{5}{4}$ means $\frac{4}{4}$ or 1 whole plus $\frac{1}{4}$. Write $\frac{5}{4} = 1\frac{1}{4}$ on the chalkboard. Say, "In order to change an improper fraction to a mixed numeral, we must determine the number of wholes we can construct and how many fractional pieces are left over."

e.g.,

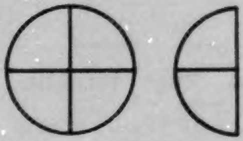


Repeat this procedure using other concrete representations.

3.06.05.04 **change a mixed number to an improper fraction**

STRATEGY 1: Using a flannel board or pieces of construction paper show $1\frac{2}{4}$.

e.g.,

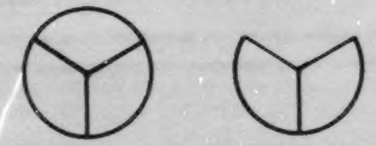


Ask a student to count the number of wholes and fourths. Write the mixed number $1\frac{2}{4}$ on the chalkboard. Ask a student to count the fourths. Say and write, "$1\frac{2}{4} = \frac{6}{4}$."

Repeat this procedure using other examples on the flannel board.

STRATEGY 2: Write a mixed number on the chalkboard, e.g., $1\frac{2}{3}$. Ask a student to draw a diagram representing the fraction.

e.g.,



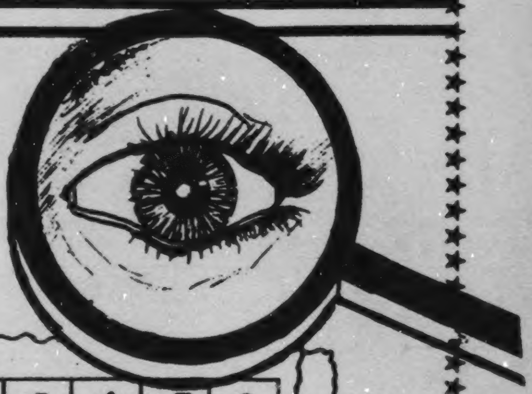
Ask another student to count the number of thirds in the diagram. (five thirds) Write on the chalkboard, $1\frac{2}{3} = \frac{5}{3}$.

Repeat this procedure using other examples of mixed numbers.

P.O. 3.06.05.01

NAME:______________________________CLASS:__________DATE:________

Shade in the letters under the improper fractions to spell a secret message.



SECRET MESSAGE

$\frac{2}{3}$	$\frac{8}{6}$	$\frac{3}{1}$	$\frac{1}{2}$	$\frac{5}{4}$	$\frac{2}{7}$	$\frac{1}{7}$	$\frac{6}{9}$	$\frac{8}{7}$	$\frac{5}{8}$	$\frac{4}{10}$	$\frac{7}{6}$	$\frac{9}{10}$
I	L	P	A	R	M	A	W	L	H	I	P	Z

$\frac{6}{8}$	$\frac{9}{4}$	$\frac{3}{5}$	$\frac{12}{11}$	$\frac{6}{8}$	$\frac{5}{1}$	$\frac{5}{8}$	$\frac{1}{3}$	$\frac{3}{4}$	$\frac{8}{6}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{6}{7}$
A	R	T	L	F	P	I	N	D	Q	I	N	G

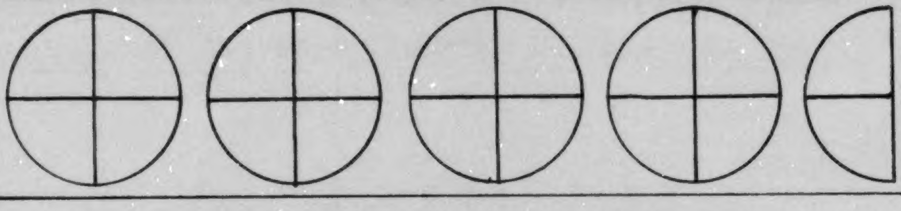
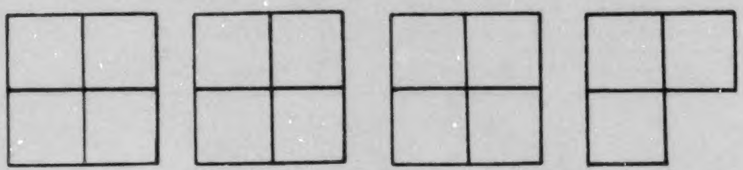
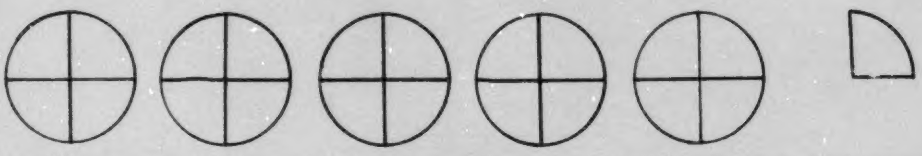
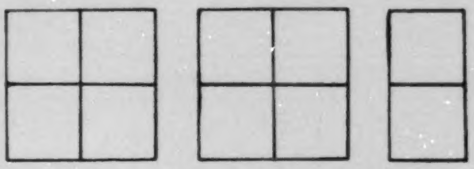
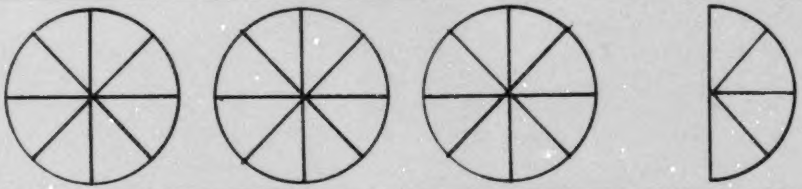
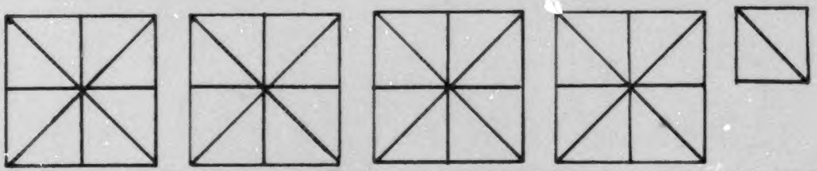
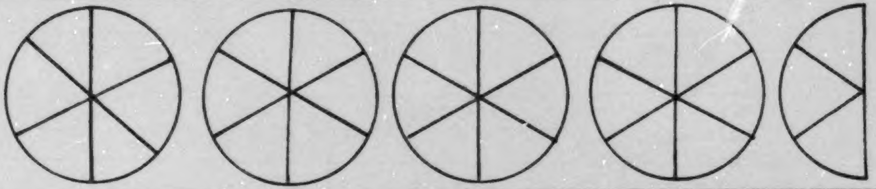
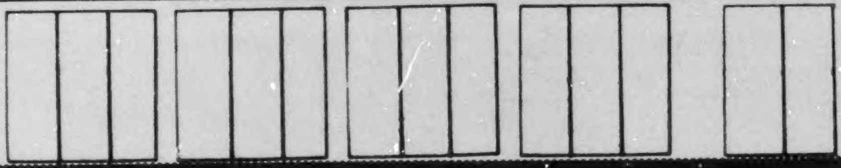
$\frac{2}{8}$	$\frac{8}{6}$	$\frac{9}{10}$	$\frac{5}{4}$	$\frac{5}{8}$	$\frac{10}{7}$	$\frac{2}{5}$	$\frac{6}{3}$	$\frac{6}{9}$	$\frac{9}{12}$	$\frac{4}{1}$	$\frac{4}{5}$	$\frac{6}{8}$
I	L	M	I	P	O	R	P	O	P	S	E	R

$\frac{7}{4}$	$\frac{2}{5}$	$\frac{4}{5}$	$\frac{8}{6}$	$\frac{6}{10}$	$\frac{1}{5}$	$\frac{5}{2}$	$\frac{2}{3}$	$\frac{7}{1}$	$\frac{5}{6}$	$\frac{4}{5}$	$\frac{6}{9}$	$\frac{6}{7}$
N	F	R	E	A	C	R	T	S	I	O	N	S

P.O. 3.05.05.02

NAME:______________________________ CLASS:__________ DATE:________

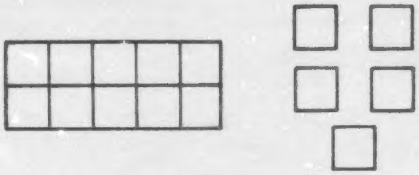
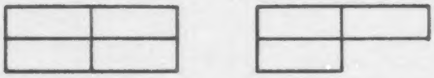
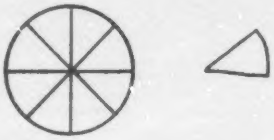
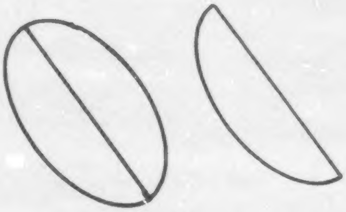
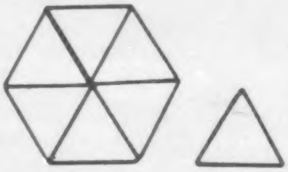
Write the mixed number that each drawing represents.

	Mixed Number
	$4\frac{1}{2}$
	
	
	
	
	
	
	

P.O. 3.06.05.03

NAME: ______________________ CLASS: ________ DATE: ________

Fill in the chart.

Improper Fraction	Wholes and Parts	Mixed Number
$\frac{15}{10}$		$1\frac{5}{10}$
$\frac{7}{4}$		
$\frac{9}{8}$		
$\frac{3}{2}$		
$\frac{7}{6}$		

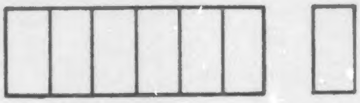
550

P.O. 3.06.05.04

NAME: ________________________ CLASS: __________ DATE: _______

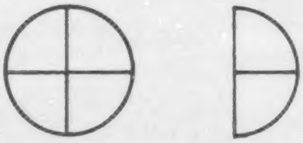
Write the mixed number as an improper fraction.

$1\frac{1}{6}$



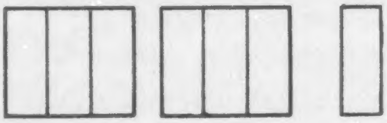
$= \frac{7}{6}$

$1\frac{2}{4}$



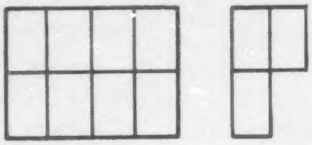
$=$

$2\frac{1}{3}$



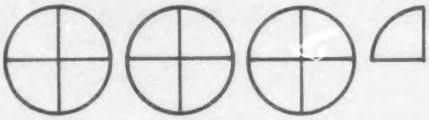
$=$

$1\frac{3}{8}$



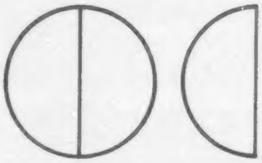
$=$

$3\frac{1}{4}$



$=$

$1\frac{1}{2}$



$=$

3.07.02 ADDITION AND SUBTRACTION OF DECIMALS TO TENTHS

(3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.07.02.01B add decimals in horizontal and vertical format without regrouping;
e.g.,

$$\begin{array}{r} 4.3 \\ \underline{+2.1} \\ 6.4 \end{array} \qquad 4.3 + 2.1 = 6.4$$

3.07.02.02B subtract decimals in horizontal and vertical format without regrouping;
e.g.,

$$\begin{array}{r} 4.7 \\ \underline{-3.2} \\ 1.5 \end{array} \qquad 4.7 - 3.2 = 1.5$$

3.07.02.03B solve word problems related to skills in this module.
e.g.,

Alan rode his bike 3.2 miles on Monday and 2.6 miles on Tuesday. How many miles did he travel?

$$\begin{array}{r} 3.2 \\ \underline{+2.6} \\ 5.8 \end{array} \text{ miles} \qquad \begin{array}{r} \underline{\text{check}} \\ 5.8 \\ \underline{-2.6} \\ 3.2 \end{array}$$

3.07.02

VOCABULARY

TERMS

decimal
tenth

GETTING STARTED

Prepare five sets of cards where each card has a decimal, an equivalent fraction or mixed number on it.

e.g., $\boxed{.6}$, $\boxed{\frac{6}{10}}$, $\boxed{2\frac{1}{10}}$, $\boxed{2.1}$.

Divide the class into groups of six and choose a dealer for each group. The dealer deals out 7 cards to each student and places the balance of the cards on the center of the table.

If a student has an equivalent pair, he/she places it on the desk. The player to the left of the dealer goes first and selects a card from the center pile. If he/she makes a pair he/she places it down and discards a card. If not, he/she just discards a card. Play ends when a player has no more cards in his/her hand.

Prepare and distribute a class set of 3 x 3 grids with mixed numbers in four boxes and an operation sign in the lower right box.

e.g.,

$4\frac{2}{10}$	$6\frac{1}{10}$	
$3\frac{1}{10}$	$2\frac{4}{10}$	
		+

$6\frac{4}{8}$	$2\frac{3}{8}$	
$2\frac{1}{8}$	$1\frac{1}{8}$	
		-

Ask the students to use the operation indicated, and add or subtract vertically and horizontally.

e.g.,

$4\frac{2}{10}$	$6\frac{1}{10}$	$10\frac{3}{10}$
$3\frac{1}{10}$	$2\frac{4}{10}$	$6\frac{5}{10}$
$7\frac{3}{10}$	$8\frac{5}{10}$	+

$6\frac{4}{8}$	$2\frac{3}{8}$	$4\frac{1}{8}$
$2\frac{1}{8}$	$1\frac{1}{8}$	1
$4\frac{3}{8}$	$1\frac{2}{8}$	-

3.07.02

3.07.02.01 **add decimals in horizontal and vertical format without regrouping**

STRATEGY 1: Write these examples on the chalkboard and ask the students to add them:

$$\begin{array}{r} 3\frac{1}{10} \\ +2\frac{1}{10} \\ \hline \end{array} \qquad 4\frac{2}{10} + 2\frac{2}{10} = \qquad \begin{array}{r} 5\frac{4}{10} \\ +2\frac{5}{10} \\ \hline \end{array}$$

Say, "What is the rule for adding a mixed number?" (Add the fractions and then the whole numbers.) Ask three students to come to the chalkboard and rewrite the above examples as decimals.

e.g.,

$$\begin{array}{r} 3.1 \\ +2.1 \\ \hline \end{array} \qquad 4.2 + 2.2 = \qquad \begin{array}{r} 5.4 \\ +2.5 \\ \hline \end{array}$$

Say, "Our addition procedure will not change when we change the numbers to decimals. We add in exactly the same way except for the addition of a decimal point." Repeat this procedure usng other examples.

STRATEGY 2: Prepare and distribute a number of ten strips and hundred squares to each student. Say, "Use the squared material to add 3.2 + 2.6 = ." Ask a student to show the addition using squared material. Ask another student to do the addition at the chalkboard. Say, "Where do we put the decimal point in the answer?" (In line with the other decimal point.) Repeat this procedure using other examples.

3.07.02.02 **subtract decimals in horizontal and vertical format without regrouping**

STRATEGY 1: Adapt Strategy 2 used in P.O. 3.07.01.03.

STRATEGY 2: Write the following example on the chalkboard: 37 - 12 = . Say, "What is the answer to this example?" (25) Write the same example on the chalkboard with decimal points, e.g. 3.7 - 1.2 = Say, "The same procedure is used in the subtraction of decimal numbers. We must remember to include the decimal point in the answer." (2.5)

3.07.02.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write this problem on the chalkboard.

Bill's garden is 4.2 feet long and 2.1 feet wide. How much fencing should Bill buy to go around his garden?

Ask a student to read the problem, determine the correct operation, and estimate the answer. Ask another student to solve the problem.

Repeat this procedure using other word problems.

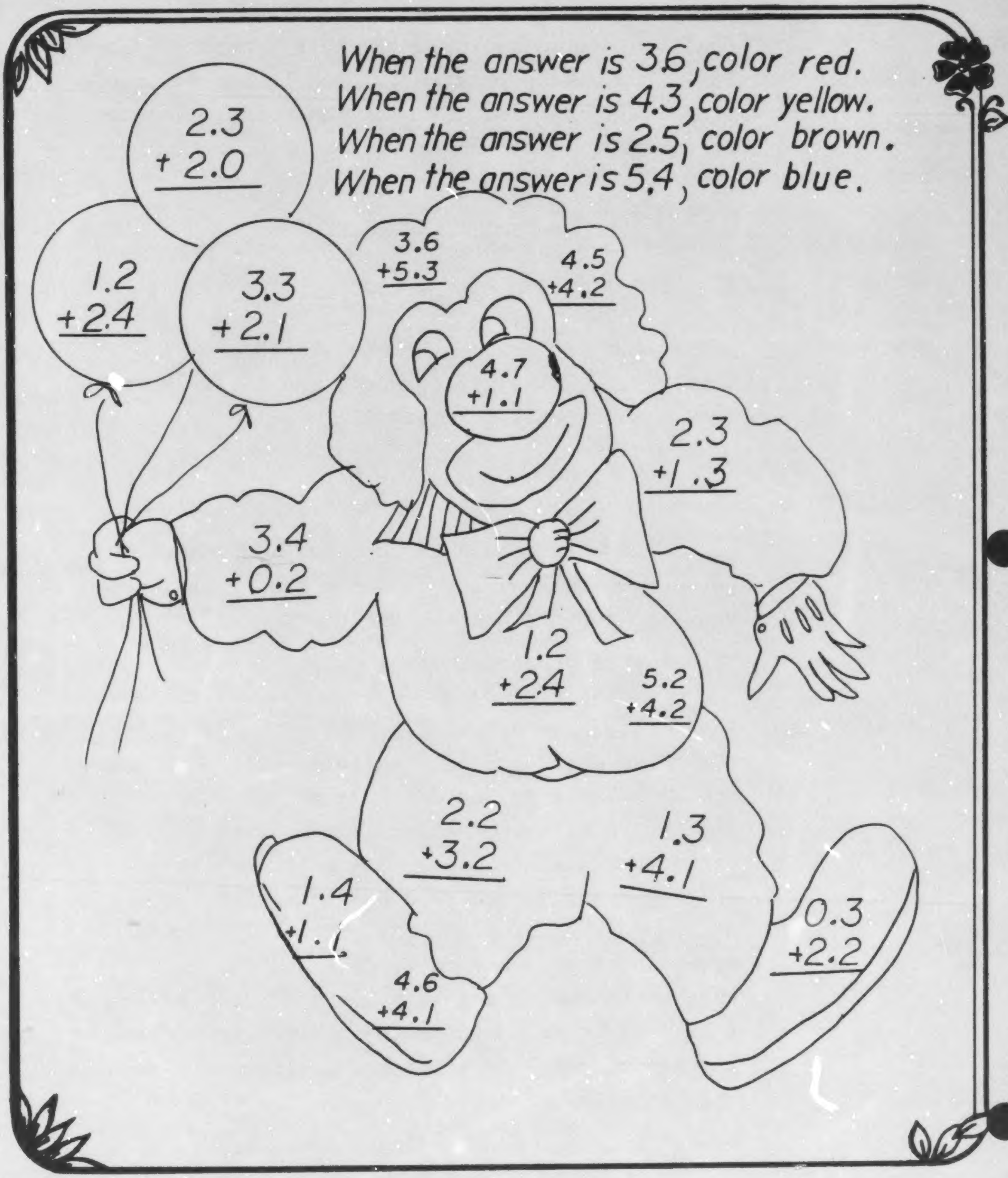
STRATEGY 2: Play "Telephone Problems." Say, "We are going to play a word problem game where we will only use decimals. One day Doreen went to the store and bought 2.3 meters of ribbon and brought it home. Her mother said, '...' " Ask a student to continue, e.g., "you need 6.4 meters of ribbon." Ask another student to continue, e.g., "How much more ribbon does Doreen need?" Ask the students what operation to use to solve this problem and ask a student to write it on the chalkboard. Ask another student to estimate the answer and then do the actual calculation.

Repeat this procedure using other stories.

P.O. 3.07.02.01

NAME:______________________________ CLASS:__________ DATE:________

Follow the directions and color.



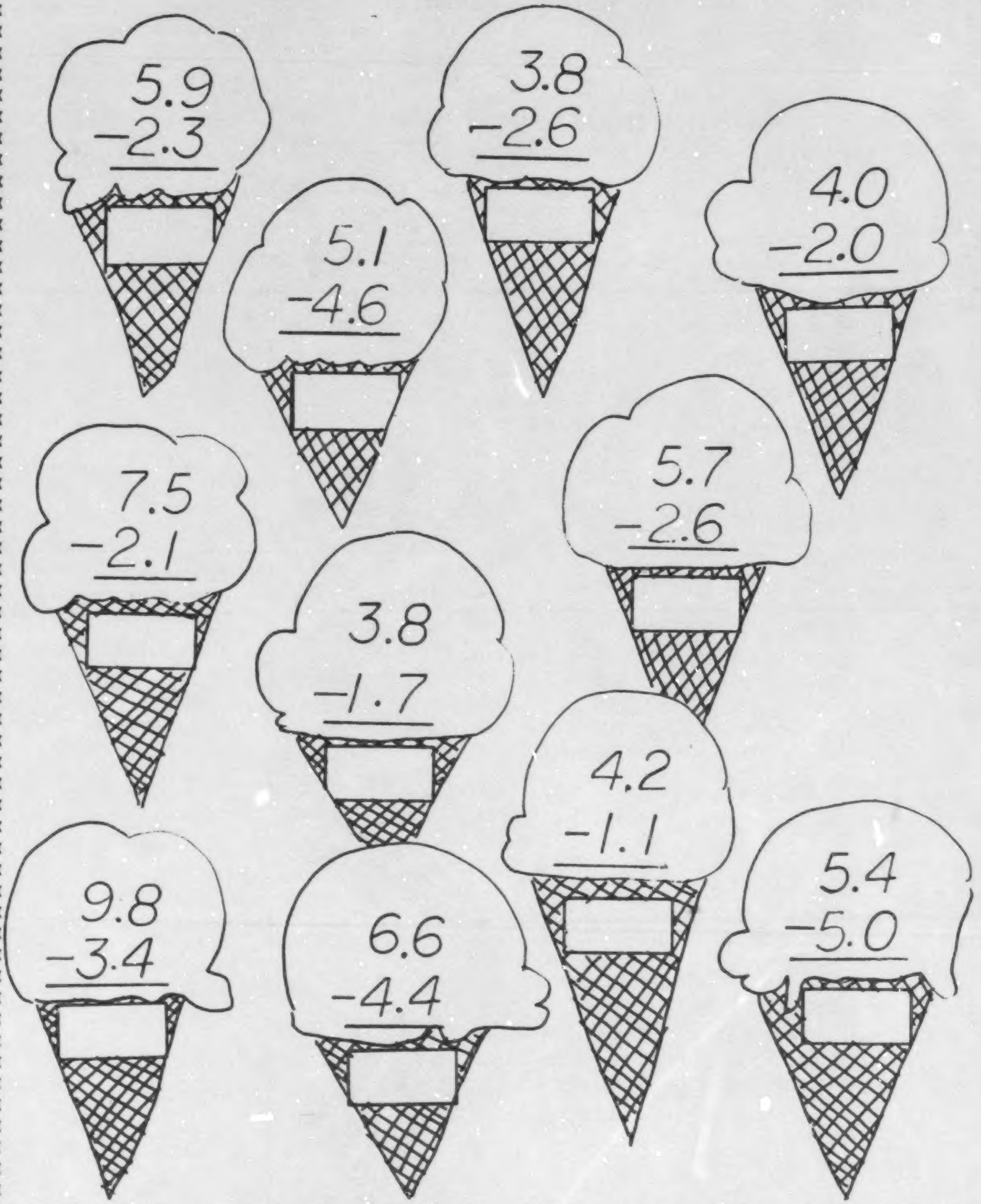
When the answer is 3.6, color red.
When the answer is 4.3, color yellow.
When the answer is 2.5, color brown.
When the answer is 5.4, color blue.

2.3 + 2.0
1.2 + 2.4
3.3 + 2.1
3.6 +5.3
4.5 +4.2
4.7 +1.1
2.3 +1.3
3.4 +0.2
1.2 +2.4
5.2 +4.2
2.2 +3.2
1.3 +4.1
1.4 +1.1
4.6 +4.1
0.3 +2.2

P.O. 3.07.02.02

NAME: ______________________ CLASS: __________ DATE: ________

Subtract each example.
Write your answer in the bottom of the ice cream cone.



5.9 −2.3
3.8 −2.6
5.1 −4.6
4.0 −2.0
7.5 −2.1
5.7 −2.6
3.8 −1.7
4.2 −1.1
9.8 −3.4
6.6 −4.4
5.4 −5.0

P.O. 3.07.02.03

NAME: ______________________ CLASS: __________ DATE: __________

Solve each problem.

1. Dick used 2.4 boxes of nails. Barbara used 1. Dick used 2.4 boxes of nails. Barbara used 3.5 boxes. How many boxes of nails were used in all? 	WORK SPACE
2. Jason had 3.4 cans of paint. He used 2.3 cans of paint. How many cans of paint were left? 	
3. Joe bought 22.4 m of rope for the tree house. Helen gave him 8.2 m more. How much in all? 	
4. The tree house flag is 4.5 m high. Miriam lowers it 0.3 m. Michael lowers it 0.2 m more. How high is the flag now? 	

3.13.04 PATTERNS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

3.13.04.01A complete a numerical pattern and state the rule for the pattern;

e.g.,

1 4 7 10 ☐ (add 3)

20 16 12 8 ☐ (subtract 4)

3.13.04.02A arrange numbers to form a pattern and state the rule for the pattern.

e.g.,

Make up a pattern from the following numbers.

10 20 25 30

5 15 40 35

VOCABULARY

TERMS

pattern

GETTING STARTED

Prepare a set of colored cubes. Make a pattern using the cubes, e.g., two red, one blue, three yellow. Display the pattern. Say, "What comes next?" (two red) Ask a student to add the two reds. Ask two or three more students to continue the pattern.

Break up the pattern. Ask several students to start a new pattern. Ask other students to continue each pattern. Draw patterns on the chalkboard for students to copy into their notebooks.

Elicit and record on the chalkboard the multiples of 5 as follows.

I	II	III	IV
5	10	15	20
25	30	35	40
45	50	55	60
65	70	75	80
85	90	95	100

e.g.,

> Horizontally, alternating multiples end in zero or five. Vertically, the difference is 20 in Column I, Column II counts by ten, Column IV counts by 20, and Columns I and III end in five.

Ask the students to find the patterns in this array. Say, "What patterns could you find if we write the numbers like this?"

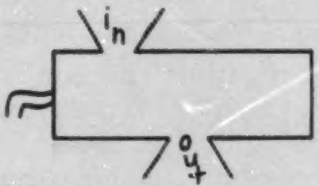
I	II	III	IV	V
5	10	15	20	25
30	35	40	45	50
55	60	65	70	75
80	85	90	95	100

3.13.04

3.13.04.01 **complete a numerical pattern and state the rule for the pattern**

STRATEGY 1: Draw the following diagram on the chalkboard.

e.g.,



Say, "This is a function machine. At the top is the word IN. At the bottom is the word OUT. The function machine takes in numbers at IN. At a turn of the crank a new number will come OUT. Let's see what would happen if I wanted the machine to add 2 to each number I fed it." Draw a table on the chalkboard.

e.g.,

IN	OUT
1	
2	
3	

Say, "If I put in a 1, what number will come out?" (3) Record it on the chart. Repeat this procedure for other numbers.

Say, "Now I will give you a table. I will fill in all of the numbers for IN and some for OUT. You will fill in the rest of the numbers and find the rule for this pattern."

e.g.,

IN	OUT
1	3
2	6
3	

(x3)

STRATEGY 2: Write the following pattern on the chalkboard.
e.g.,

1, 4, 7, 10, ___, ___,

Say, "How do we get from 1 to 4? (add 3) How do we get from 4 to 7? from 7 to 10? What number will come next?" (13) Ask a student to come to the chalkboard to continue the pattern. Say, "What is the rule that fits this pattern?" (+3)

Repeat this procedure using other patterns.

3.13.04.02 arrange numbers to form a pattern and state the rule for the pattern

STRATEGY 1: Prepare a set of cards numbered from 1 to 20. Take cards 2, 4, 6, 8, 10 and shuffle them. Distribute this set to a student. Ask him/her to put the cards in order to show a pattern.
e.g.,

2, 4, 6, 8
8, 6, 4, 2

Say, "What is the rule for the pattern?" (add two or subtract two)

Repeat this procedure.

STRATEGY 2: Write various rules on index cards, e.g., write the first two numbers in a pattern where the third number is 12 and the rule is add 3. Ask a student to read the rules on the cards and write the pattern on the chalkboard, e.g., 6, 9, 12.

Continue this procedure using other cards.

P.O. 3.13.04.01

NAME: ______________________ CLASS: __________ DATE: ________

Fill in the missing numbers.
Write a rule for each.
Example 2, 4, 6 8 10 12

16, 18, 20, ☐, ☐, ☐

name of rule ____________

45, 40, 35, ☐, ☐, ☐

name of rule ____________

14, ☐, 28, ☐, 42, ☐

name of rule ____________

57, ☐, 43, ☐, 29, ☐, ☐

name of rule ____________

IN

1	9
2	18
3	27
4	
5	
6	

OUT

name of rule ____________

IN

26	31
28	33
32	37
45	
53	
61	

OUT

name of rule ____________

IN

1	4
2	
3	12
4	
5	20
6	

OUT

name of rule ____________

Make one of your own.

IN

OUT

name of rule ____________

P.O. 3.13.04.02

NAME: ______________________ CLASS: ________ DATE: ________

Form the correct number pattern in each box.
Then write the rule for each.

10, 5, 20, 15, 25, 40, 35, 30

$\boxed{5}$, ☐, ☐, ☐, ☐, ☐, ☐, ☐

rule ____________________

18, 9, 45, 27, 36

☐, ☐, ☐, $\boxed{36}$, ☐

rule ____________________

4, 0, 12, 6 10, 2

$\boxed{12}$, ☐, ☐, ☐, ☐, ☐

rule ____________________

8, 5, 11, 14, 2, 17

☐, ☐, ☐, ☐, ☐, ☐

rule ____________________

Write a pattern.
The third number is 37. The rule is subtract 7.

Write a pattern.
The first number is 10. The rule is add 3. Stop at 25.

Write a pattern
The second number is 14. The rule is add 2. Stop at 20.

Write a pattern.
The fourth number is 18. The rule is subtract 5. Stop at 0.

Write your own rule. Let a friend write the pattern.

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